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The Lumleian Lectures
ON
MODERN ASPECTS OF HEART DISEASE.

Delivered before the Royal College of Physicians of London

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LECTURE II.[1]

Delivered on March 15th.

DISTURBANCE OF CARDIAC RATE.

MR. PRESIDENT AND GENTLEMEN,—The second great disorder of the heart is characterised by a disturbance of the rate, which in the vast majority of cases means an acceleration, and in the minority a retardation, of rate. An increase of the heart's rate, as compared with the normal standard of adult life, may be found under various conditions, both physiological and pathological. Thus in infancy and childhood the heart beats more rapidly, and may be presumed to do so in order to meet the demands of the growing organism. In many forms of general disease an increase in the cardiac rate is part of the general disturbance, just as a rise in temperature is. The increase is not probably of much importance in itself and does not, as a rule, lead to any special symptoms.

Acceleration of Cardiac Action.

In connexion with actual disease of the heart, writers in the past have noted the frequent occurrence of a rapid cardiac action, and they have speculated widely as to the causes of this increase. As a rule the symptom, especially if progressive, has been ascribed to increasing feebleness of the myocardium and cardiac failure. The writers do not seem to have considered very fully what the results of a persistently rapid action are on a previously damaged heart. Yet this question is one of great practical importance in connexion with prognosis and treatment. The old terms "failure of compensation" and "broken compensation" conveyed no information of any value because the actual process at work was unknown. These descriptive terms are now known to apply to conditions of cardiac failure brought about in many cases by an increase of cardiac rate, or, to be more precise, by the weakening effect which the rapid rate has on the efficiency of the left ventricle.

It may be allowed that there is a certain range of alteration in the cardiac rate, above and below the normal, which in all probability has no important effect on the heart and leads to no symptoms. As regards an increase, if we take 75 beats per minute as the normal, an increase up to 100—that is, of 25 beats—will not probably be productive of any definite effect on a healthy heart. Similarly, a reduction of the rate to 50—that is, of 25 beats, will not of itself affect the efficiency of the heart. It is outside these limits that we find symptoms beginning to appear which are to be traced to the heart-rate. It is not only from the symptoms that we can infer that the rate is affecting the heart's efficiency; there are also definite changes in the heart itself, for example, dilatation, and evidences of a deficient circulation, for example, congestion of the liver, which may follow as a direct result of an excessively rapid action of the heart.

If we take 100 beats per minute as our limit for cardiac efficiency we shall find that every increase of 10 beats may make a difference in the efficiency. Such an increase certainly makes a difference in the strain thrown upon the heart, so that we may express the increase as being a 10 per cent., 20 per cent., or 50 per cent. added strain to the heart, according to the number of heart beats above 100 added per minute. Although the ventricular contractions are weaker as compared with those of the normal or slower rate, no perceptible changes may follow at first. Working at an increased rate the ventricle eventually suffers because of the loss or diminution of its normal resting time (diastole) when fresh energy is built up. It may be that for a time a doubling of the ventricular rate allows of the circulation being maintained at its former level, or even in some ways of being improved, but the continuance of such a rate will eventually tell on the ventricular power. If we adopt the terms "rest power" and "reserve power" as applied to the heart, it will naturally be the reserve power which is diminished first.

It will probably be found that a continuous rate of 120, 130, or 140 will always tend to affect the ventricular action eventually. An 80 per cent. increase (rate of 180) will be sooner productive of serious results. These will arise even in hearts which have been previously healthy, but naturally they will be manifested sooner in hearts which are diseased. There are certain factors which have to be taken into account in estimating how a diseased heart will be affected by a marked increase of rate—that is, above the standard of 100 beats per minute. (1) The age of the patient. In the young an increase of rate is not so pathological or so productive of injurious effect as in adult life and old age. (2) The state of the myocardium of the left ventricle. A healthy myocardium will "carry on" successfully, when a diseased myocardium would show signs of stress. (3) The amount of strain already thrown on the ventricle from associated disease in other parts—for example, the presence of valvular lesions. (4) An associated irregularity of rhythm. The diastolic filling of the ventricle, already defective by reason of the arrhythmia, may be seriously interfered with by the shortening of the diastole. The effect of the cardiac irregularity may thus be much enhanced by an increase in the rate. (5) The suddenness of onset of a great increase of rate may disturb the ventricular action much more than if the process had been slow and progressive. This is well shown in some forms of tachycardia, when the heart has no time to accommodate itself to the excessively rapid action which sets in abruptly.

During the course of a general infection (rheumatic fever) or during active carditis an increase of cardiac rate may be regarded as a normal reaction. It does not, as a rule, demand any special treatment, because it is usually moderate in degree and a temporary disturbance. The class of case in which a rapid rate may be said to be injurious is that in which, in the absence of any general cause or local cardiac inflammation, there appears to be a permanently irritable or excitable focus in the heart. From this focus start numerous impulses which, while causing frequent contractions in the auricles, unimportant in character, may also cause an excessive rate of ventricular contractions. Under these conditions the increase of rate does not cease while the patient is asleep, although it may be less pronounced, and it may be considerably augmented by excitement or by physical exertion. The reserve power of the heart is certainly diminished in all such cases, and according to the degree and persistence of the increased rate the rest power may be encroached on. This subject will be further referred to when we deal with the question of therapeutics.

Retardation of Cardiac Action.

A slow rate of the heart, slower, that is, than 40 beats per minute, may also have, if prolonged, an injurious effect on the circulation. The ventricle does not suffer in itself, but under certain conditions it fails to maintain a sufficient supply and pressure of blood in different organs, more especially in the cerebral centres. A total bradycardia—that is, a slowing of the heart-rate which starts at the sinus node and is continued through the heart-beat—is not usually of clinical importance. The pathological slowing, which is important, will be found dealt with and explained under the heading of "Heart-block" in the current literature. It forms a particularly illuminating chapter in the history of the successful analysis of disturbances in the cardiac rhythm and rate. Gaskell found that by clamping the junctional tissues which form a bridge between the auricles and ventricles he was able to form a barrier or block, so that only a certain number of impulses passed through. According to the amount of pressure exercised, only every second or third or fourth impulse was able to pass, and the ventricular action was slowed accordingly. This is known as partial heart-block. By raising the pressure still more he was able to form a complete barrier or block, so that no impulses at all reached the ventricle from above. This is known as complete heart-block. When this happens a latent and unsuspected action of the ventricle comes into play, as shown

[1] Lecture I. was published in THE LANCET of March 17th, 1917, p. 401.

by its starting a rhythm and rate of its own, at first rather irregular, but tending soon to settle down to a regular beat at a rate much below normal. So that below the junctional tissues, in some part of the ventricular wall, there lies a centre, usually dormant, capable of impulse formation and discharge and of starting ventricular contractions.

The clinical bearing of these facts has been very thoroughly worked out by Mackenzie. He showed that in disease partial heart-block is frequently produced through lesions of the junctional tissues. The conducting bridge of the junctional tissues becomes a barrier to the impulses descending from above, and only a certain number get through at regular or irregular intervals, so that the rate and regularity of the ventricular contractions bear no fixed relation to the auricular rate and regularity. The ventricular rate is influenced by the rate at which impulses are able to pass the barrier. The clinical proof of these conditions can be demonstrated very clearly by means of graphic records. It would appear, further, that partial heart-block may result not only from damage to the junctional tissues, but from an excessive number of stimuli descending from above and exhausting the powers of conductivity of normal junctional tissues. The bridge becomes blocked from excess of traffic. This is manifested in the clinical conditions of auricular flutter and auricular fibrillation. The conducting tissues are stimulated to such an extent that they are incapable of transmitting all the impulses reaching them. The condition of partial heart-block is thus seen to be proved in experimental physiology; it is also demonstrable in various forms of cardiac disease and disturbance, and it is capable of being induced by means of drugs in the treatment of heart disease, as will be described later in dealing with digitalis therapy.

Complete heart-block is the result of organic disease affecting the junctional tissues to such an extent that no impulses reach the ventricle from above. The idio-ventricular rhythm and rate which then develop, or which may develop, are apt at first to lead to attacks of syncope because of the prolongation of some of the diastolic pauses. After a time the action becomes more regular, the rate is usually about 30, and symptoms of ventricular inefficiency may disappear. The site of origin of this rhythmic action of the ventricles is now reasonably assumed to be in some part of the auriculo-ventricular bundle in connexion with the ventricles. One thing marks it out as different from all the other abnormal rhythms which have been considered. When a new rhythm has been started from some abnormal focus we have found that the rate was always faster than normal. As the result of complete heart-block the new rate of the ventricles is always slower than the normal rate. The new rate, although slow, may allow of a sufficient number of ventricular contractions to ensure the maintenance of the circulation, at perhaps a lower level than formerly. The important point about the new rhythm is that it should be regular. If the intervals between the beats are too prolonged the pressure in the cerebral vessels falls, and unconsciousness and even convulsive movements follow. These conditions are seen clinically in the symptom-complex which is known as Stokes-Adams's disease. If the ventricular rate falls below a certain level the intervals between the beats are so prolonged that death ensues.

Relation of Disturbances to Supra-ventricular Tissues.

The disturbances in rhythm and rate which we have been considering have come to occupy a most important place in connexion with the etiology of cardiac weakness and cardiac failure. We have already stated that these disturbances tend to affect injuriously the efficient action of the left ventricle. It is interesting to note, further, that every form of disordered action of the heart, be it an irregularity of rhythm or an excessive rate, or a diminished rate, is always supra-ventricular in origin. That is to say, these disturbances arise outside of the contractile muscle of the ventricles, except, perhaps, the ventricular extra-systole. There may be other exceptions to this, but so far as is at present known they must be extremely rare. Clinically, we find that the above general statement holds good. The supra-ventricular tissues, as previously defined, are the sino-auricular node, certain parts of the auricles, the auriculo-ventricular node, and the auriculo-ventricular bundle. In health these tissues regulate the rate and rhythm which are designed to lead up to efficient ventricular contractions. In diseased conditions of the heart disturbances in these tissues may lead, and do lead, up to disordered and impaired ventricular action. Some forms of supra-ventricular disturbances if reproduced in their entirety in the ventricles would make efficient ventricular action impossible. Thus, if a condition of auricular fibrillation spread unchanged to the ventricles, efficient action of the latter would cease at once and a fatal termination would ensue. As a matter of fact, sudden death does occur from ventricular fibrillation, and it is now believed that sudden death under chloroform anæsthesia is due to ventricular fibrillation. By a process of blocking of certain of the impulses at the junctional tissues—partial heart-block—a diminished number of them reach the ventricles which are thus able to carry on the circulation. To express this in another way, impulse formation and impulse discharge may develop at a dangerous rate—dangerous, that is to say, if it spread to the ventricles—but the conducting tissues fail to develop the same rate of conductivity, and the ventricular action is successfully carried on.

The disturbances referred to above arise in the heart and as a result of disease of the heart. Other injurious influences arising from without may reach the heart through the nervous system and produce similar disturbances. They have first of all to pass through the defences of the supra-ventricular tissues, where they are often so modified that any threatened danger to the ventricles is removed. We may regard the vagus and the accelerator nerves as always on guard and controlling the functions of the supra-ventricular tissues for the benefit of the ventricles. So that it would appear that the ventricles are partially protected by the supra-ventricular tissues from disturbances which may arise in the heart itself or which may reach the heart from without.

"Soldier's Heart."

Amongst the varieties of disordered action of the heart the war has brought into prominent notice is one which is known as "the soldier's heart" or "the irritable heart of soldiers." It is in no sense comparable to the conditions we have been discussing and for this reason. The disordered action of the heart which occurs in heart disease is the result of definite changes in the muscular tissues of the heart, the supra-ventricular tissues more especially, which have arisen from inflammatory or degenerative lesions. The disorder is primarily cardiac in origin. On the other hand, the disorder in the case of the soldier's heart is essentially not cardiac in origin; it is the result of disturbance or disease in other parts of the system, which react on the heart and modify its action. This is shown in many ways. In the first place, we do not find any signs of organic heart disease to which the symptoms may be referred. The symptoms themselves are not such as can be definitely associated with any known form of heart disease, but they resemble closely those present in patients suffering from a "neurotic heart." Again, we find many other changes present which are not traceable to the cardiac condition, but clearly to a common cause. It is not the heart alone but the whole vascular system which is affected, and it is not affected in the way which we see as the result of heart disease. There is a loss of tone or power in the whole cardio-vascular system.

As regards the primary cause of the disturbances opinions still differ. Physical stress and strain, anxiety, sleeplessness, infective disease, preceding illness, and toxæmia have all been assigned the first place, and possibly each will be found to play a part if a sufficient number of cases be taken. Whatever the primary cause of disturbance one cannot fail to note in the patients the presence of nervous irritability and instability, that general condition which for want of a better term we call neurasthenia. It would appear likely from the symptoms in cases of "soldier's heart" that the cardiac phenomena do not proceed from the heart primarily, but from a disturbance of the power and action of the heart arising in the nervous centres which act on the heart. In an interesting analysis of 40 cases of "soldier's heart" John Parkinson found that in about half the cases the same disability had been present to some extent in the civil occupations pursued before the war. As he expresses it, "these men are the subjects of a cardiac disability which is unmasked by the exertion required of a soldier." This disability, whether constitutional or acquired, does not come into the category of organic heart disease. On the other hand, if certain symptoms persist—for instance, tachycardia—the effect on the heart may be as exhausting as if the tachycardia had been primarily cardiac in origin.

DILATATION OF THE HEART.

Dilatation of the heart, of one or more of its chambers, has long been recognised amongst the changes associated with valvular disease. The view taken was that dilatation was a sign of weakness, a sign that the heart was yielding to some stress or strain more than it could effectively deal with. Another form of dilatation recognised was that in which the condition developed suddenly, usually in a heart previously diseased, and was accompanied by an increase in the old symptoms or the development of fresh ones. This was called acute dilatation of the heart, and the patient was subjected to treatment for the reduction of the dilatation. As we read the clinical reports of such cases it seems clear that the sudden onset of dilatation was usually the result of some strain thrown on the heart, and was associated with the presence in the heart of a disordered action of rate or rhythm, or both. We must not, therefore, assume off-hand that the dilatation was the primary condition, or that it was due to some essential weakness of the myocardium.

Results of Experimental Research.

The whole subject of dilatation, which in its most important aspect means dilatation of the left ventricle, is admittedly one of great difficulty. It deals with the qualities of tonicity, contractility, and relaxation in the cardiac muscular tissues. On the physiological side Starling and his co-workers have recently promulgated some new views on this subject.

They state that the ventricles cannot dilate unless fluid enters them. The view that there is such a condition as muscular dilatation, leading to a filling of the ventricles by suction, does not seem to receive physiological support. If blood does not enter the heart the ventricles do not dilate at all during diastole, and may become smaller with each systole until they are empty. This is not the result of increased tonicity of the heart, but is purely a mechanical result of absent or deficient venous inflow.

Comparing the cardiac muscle to an ordinary skeletal muscle, Starling says the extending load is represented by the diastolic intracardiac pressure and is dependent on the inflow; the load against which the cardiac muscle has to contract is represented by the pressure in the aorta. In his experiments he found that it was length of cardiac muscle rather than tension which determined the energy of contraction, so that there existed a direct proportion between the diastolic volume of the heart—that is, the length of its muscle fibres—and the energy set free in the following systole. This would seem to mean that to bring out the maximum capacity of a healthy heart a moderate dilatation is advantageous. Fatigue is shown by the fact that, starting at a given length, the change from the relaxed to the contracted state is attended with a smaller production of *tension* than was the case when the muscle was fresh. This means that a tired heart must dilate in order to carry on the same work as the fresh heart, and this is what Starling found actually occurred. If the condition is relieved, say by increasing the supply of oxygen to the heart or by diminishing the load, and the muscular tissue of the heart is given an opportunity to recover, the heart may once more return to its normal size, the evolution of energy per unit length of the muscle fibre at each contraction becoming the same as before.

This is his understanding of the word tonus or tone as applied to cardiac muscle. The term is properly employed as synonymous with physiological condition or fitness of the muscle fibre, and its measure is the energy set free per unit length of muscle fibre at each contraction of the heart. A good heart—that is, one with a good tone—will carry on a large circulation against a high arterial pressure and nearly empty itself at each contraction; while a heart with a defective tone, as is the case when it is tired, can carry on the same circulation, but only when its fibres at the beginning of contraction are much longer, that is when the heart is dilated. In the latter case the output of blood will be the same as in the former, but both the systolic and the diastolic volumes of the heart will be increased. When this dilatation proceeds to such an extent that the tension of the muscle fibres becomes increasingly inadequate in producing rise of intra-cardiac pressure, the fatigue of the heart passes on to cardiac failure.

Clinical Support of Experimental Results.

Turning to the clinical side we find a good deal of support for Starling's experimental results. In the case of healthy children there is a marked instability of all the cardiac functions, and dilatation of the heart is by no means uncommon. The fluctuations in size of the heart at this age are such as to suggest strongly that there is a self-regulating influence at work, seated in the heart, which adjusts the size of the heart to the varying calls on its powers. In the case of severe athletic exercises, such as running a race, we find that the heart becomes temporarily dilated, apparently in all its chambers. Here, again, we may assume that the dilatation is the result of the strain thrown on the heart, and is called for in order to meet the difficulties of the circulation. When an attack of paroxysmal tachycardia sets in, the patient and his heart having been previously healthy, there is not necessarily any dilatation of the heart or any noticeable change except in rate. But when symptoms of fatigue of the heart appear, breathlessness, &c., dilatation usually comes on, and this may well be an effort to render the ventricular contractions more effective. When the attack of tachycardia ceases the cardiac dilatation usually subsides rapidly. The onset of auricular fibrillation is often characterised by great distress in the breathing and a marked degree of cardiac dilatation. Usually such dilatation has been ascribed to weakness of the wall of the left ventricle; but, on the other hand, it may simply be an attempt on the part of the heart to overcome the fresh difficulties of the circulation.

The point of view that dilatation is not necessarily an indication of weakness of the cardiac muscle, and may be one of the means by which the cardiac muscle meets a disturbance or difficulty in connexion with the circulation, does not imply that it meets all difficulties in this way or that cardiac failure cannot occur without dilatation. As a matter of fact, we know that the contrary holds true. Clinical research may well be directed into determining more exactly what are the underlying conditions which give rise to dilatation. Possibly it may be that in cases of extensive degeneration the cardiac muscle has lost the power of dilating. Starling has emphasised the fact that the question of dilatation is closely associated with the venous inflow of the heart, the quantity and the pressure of the flow. He says that the output of the heart is equal to, and determined by, the amount of blood flowing into the heart, and may be increased or diminished within very wide limits according to the inflow. With a minimal inflow the venous pressure on the two sides of the heart may be zero, and with increasing inflow rises at first only slightly as long as the amount of blood flowing in is not more than sufficient to exert a minimal distension on the relaxing ventricles. With further increase in the inflow the venous pressure may be positive during diastole, causing an active distension of the heart, and an increase in the rate of filling. The greater the arterial resistance the higher will be the venous pressure for any given inflow. It seems probable from these conclusions that while certain disturbances, such as excessive rate or a disordered rhythm of the heart, may tend to induce dilatation, the question of the venous inflow and pressure has also an important bearing in determining the amount of dilatation.

SYMPTOMS.

The discovery of physical signs of heart disturbance or disease is always satisfactory from a diagnostic point of view. The presence of a cardiac murmur or irregularity does not, however, convey much information as to the functional efficiency of the heart. This question is decided chiefly by the symptoms which are complained of by the patient, or which are brought out by testing the response of the heart to various forms of physical exertion.

Symptoms are the signals of distress sent out by the heart when its efficiency has become impaired. In cases of chronic heart disease the physical signs may persist unchanged for 10 or 20 years, and the first indications of weakening of the cardiac force are to be found in the symptoms. We have therefore come to regard symptoms as the most reliable evidence of impaired action of the heart and circulation. Amongst the chief of these symptoms may be mentioned breathlessness, pain, palpitation, languor, giddiness, faintness, and fainting.

A symptom may be unrecognised by the patient. For instance, breathlessness, quite apparent to outsiders, may have come on so gradually as not to have attracted the patient's attention. In other cases the symptom—for example, pain—may be not only recognised, but very much

emphasised and exaggerated by the patient. The sensitiveness of the individual varies to an enormous extent, so that while in some cases we hear of few symptoms in others we are met with a multiplicity of them which is embarrassing. In the one case more leading and particular questions are to be asked, and in the other the different symptoms are to be more minutely examined into. It has also to be recognised that many of the symptoms associated with organic disease are reproduced with marvellous accuracy in functional disturbances of the nervous system. So that in dealing with symptoms, and in order to estimate them at their proper value, the important thing is to establish a clear correlation between the physical signs of heart disease and the symptoms complained of or elicited by testing the response of the heart to effort. Further, as the symptoms of heart weakness are not distinctive, one has to exclude other possible causes than the heart. Such symptoms as breathlessness, præcordial pain, and palpitation may come from disturbances in various organs and regions of the body. An enlarged liver and fainting attacks are not necessarily due to heart disease. Shortness of breath and a cardiac murmur or irregularity may be present without organic heart disease. Chronic renal disease and arterio-sclerosis may lead to many symptoms not unlike those of heart disease. So that while in many cases the establishment of a definite correlation between the symptoms and the signs of cardiac disease may be easy, in others care may be necessary lest we assume too readily from the presence of symptoms the existence of heart disease as the cause. Patients are especially liable to fall into this error and to come with a ready-made diagnosis of "something wrong with the heart."

Symptoms are a measure of the difficulty with which the left ventricle is meeting some strain thrown on its action. Fatigue of the heart may be shown by symptoms only after some unusual exertion has been made which, however, the patient had previously been able to make without discomfort. A further stage—weakness of the heart—is shown when the patient has increasing difficulty in making any exertion without the onset of symptoms. In Mackenzie's language this implies a diminution in the "reserve power of the heart." A further stage—failure of the heart—is reached when symptoms are present even when the patient is resting in bed or on a chair. In Mackenzie's language this means a diminution of the "rest power of the heart." In connexion with heart disease, fatigue, weakness, and failure, as defined above and as shown by the symptoms, may be regarded as milestones indicating the progressive impairment of ventricular action. Whatever the physical signs in the heart may be, a sound prognosis must take into account the importance of the symptoms, and successful treatment will be shown by the diminution or cessation of the symptoms.

Relative Importance of Signs and Symptoms at Different Ages.

We expect and usually find symptoms present at all ages when the patient is the subject of acute heart disease (myocarditis, endocarditis, pericarditis), or of a sudden and severe disturbance of rhythm such as auricular fibrillation. In the chronic forms of heart disease we find a marked difference in the relative importance of symptoms and physical signs at different ages in estimating the question of cardiac impairment.

In the young, say up to the age of 15 years, heart disease is usually part of the rheumatic infection. At this period of life the recuperative powers of the heart after an acute attack are little short of marvellous, and the symptoms manifested or complained of are often extremely slight or absent altogether. Yet the heart may have been permanently damaged. At this age, therefore, the physical signs of disease are much more important than the symptoms in forming an estimate as to how far the cardiac efficiency has been or will be impaired. It is on the physical signs that the prognosis is to be based, so far as a prognosis can be given during the years when rheumatic reinfection is so apt to occur. Symptoms, the result of disease in early life, may not assume any importance until maturity is reached or even later. Possibly the physical signs of disease may not have altered much since childhood, but impairment of the functional efficiency of the left ventricle will first of all be indicated by symptoms when the physical stress of life has begun to tell on the previously damaged heart.

From middle life on through old age there is another large class of case met with—namely, those with degenerative changes in the musculature of the heart. Here the physical signs of heart disease may be slight or absent, but the symptoms are often clearly indicative of weakness in the action of the left ventricle. The extent of the weakness can be roughly estimated by the response which the individual makes to effort, long before confirmatory evidence is obtained in the form of œdema, &c.

CARDIAC THERAPEUTICS.

In acute inflammatory disease of the heart it is generally agreed that the field of direct cardiac therapeutics is extremely limited. We employ measures to allay or remove any infective disease in the system, such as rheumatic infection, and we adopt those measures which experience has shown useful in the case of fevers generally. We do not possess any direct means of checking disturbed action or strengthening cardiac action when the heart is in a state of inflammation, acute or subacute. This period is short-lived compared with that which follows, in which the effects are shown in the form of chronic heart disease. The time at which the treatment of chronic heart disease begins and the form which it takes seem to vary considerably with the individual therapeutist. In some cases whenever a cardiac murmur is discovered digitalis is given. In others, when a valvular lesion is diagnosed from the murmur, digitalis is given. In others, when some change in the heart is diagnosed as the result of a valvular lesion, digitalis is given. In others again, while valvular lesions and cardiac changes may have been recognised, treatment is deferred until "compensation has broken down." These statements are not based on the teaching or text-books of the day, but on the experience gained in professional intercourse. It is not necessary to consider any treatment which is based merely on a cardiac murmur or a valvular lesion, but that based on failure of compensation calls for comment.

Nature of Compensation and Compensatory Changes.

The so-called compensatory changes are the result of efforts which the heart has made to overcome some mechanical interference with its efficient action. In its simplest form it is seen in the dilatation and hypertrophy of the wall of some chamber in order to overcome the effect of an obstruction in front, for instance, the right ventricle in mitral stenosis. We may compare this with the dilatation and hypertrophy of the stomach wall in pyloric stenosis. The compensatory change is more complicated in the case of aortic regurgitation with mitral regurgitation when the left ventricle has to compensate for a great loss of its systolic power by a double valvular leakage. In the case of adherent pericardium, when some part of the heart is fixed to the chest wall, the compensatory changes may be of a most complicated kind because of the tying down of the heart.

In all of these cases great changes may take place in the size of the heart, and they are evidently purposive and directed solely to the carryitg on of the circulation. How are they brought about? It would appear that the automatic powers of the heart are solely responsible for these changes. For they are manifested in cases in which no treatment has been adopted, and they are seen more especially in youth when the natural recuperative and adaptive powers of the heart are much greater than in later life. In the case of a very large and hypertrophied heart we may assume that the unaided powers of nature have produced the condition, and that the enlargement is compensatory in character. There is no known method of producing such a result by drugs or other treatment, and it is very doubtful whether we shall ever be able to improve on it.

Condition when Compensation has Broken Down.

Such would appear to be the nature of compensation and compensatory changes. What is the condition when compensation has broken down? The term "failure of compensation" was applied in cases where there was a more or less sudden breakdown of the heart, with marked subjective symptoms of distress and usually with well-defined physical changes in the heart. The old view was that the heart had given out. Sometimes it was described as "right-sided failure" and sometimes as "left-sided failure," according to the predominance of certain signs. The aim of hopeful therapeutists was "to increase the tone of the heart muscle," or "to strengthen the cardiac action," or "to improve the

contractile power of the heart," as it was variously expressed. Now, if we are not able to add one muscular fibre to the heart or to improve the contractile power of the heart in order to prevent the "failure of compensation" it does not appear to be likely that we shall be able to do so when failure has set in. Yet this was what was usually attempted in cases of "loss of compensation" and what many claim still that they can do by means of digitalis.

There may be attacks of cardiac weakness induced by over-exertion or illness, but they are temporary and relieved by rest and do not fall within the category of failure of compensation. There may also be failure of the power of the left ventricle to carry on the circulation, a primary loss of contractile power from exhaustion, in which case the end is not usually far off, and treatment is of little avail. But in the vast majority of cases of "failure of compensation" with symptoms there is a new factor present which is of great importance. That factor is the development of a new and abnormal rhythm in the heart, which has interfered with the cardiac action to such an extent that a "failure of compensation" has been diagnosed. The abnormal rhythm is, as a rule, accompanied by a great increase in the ventricular rate, and this adds to the impairment of the cardiac efficiency.

Now the importance of these two, an abnormal rhythm and a rapid action of the heart, would appear to lie in this, that they react so injuriously on the ventricular contractions as to produce the signs and symptoms on which a diagnosis of "failure of compensation" has been based. One might say that there has been a disturbance of the compensatory action of the heart, in the sense that this action is weakened from the presence of a new rhythm or from tachycardia. But to say that "compensation is lost" is to say that all is lost, for the carrying on of the circulation has been dependent on the compensatory changes, and we cannot influence them directly. As a matter of fact, in cases coming under this description we know that if the disturbing factors are removed or checked by treatment the compensatory changes will be found unimpaired and ready to carry on the circulation efficiently. Successful treatment will depend on the recognition of the exact form of disturbance which has upset compensation and on the application of the above facts in the employment of our chief drug in heart disease—namely, digitalis.

Direct or Indirect Action of Digitalis?

In considering the action of digitalis a clear distinction must be drawn between its direct and indirect action. The fact that it has a special and direct action on the cardiac action is universally accepted, and the method of this action will be discussed later on. It has also been maintained by many that digitalis has a direct action on the kidneys, on the arterioles, and on the blood pressure, while others assert that this is only an indirect action due to and dependent on the increase in the cardiac efficiency. The former view is probably based chiefly on experimental work on animals, the deductions from which have been applied, without clinical observation, to the human subject under conditions of cardiac failure. Experience has shown that conclusions of this nature are extremely unreliable.

The view that digitalis has only an indirect action on the kidneys is now strongly supported by pharmacologists and physicians. Cushny states that the diuresis "appears to arise not from a direct action on the secretory mechanism, but only indirectly through the changes in the circulation; the kidney shares in the general acceleration of the blood and functions more vigorously." The change in the renal activity under digitalis is not due to any local vascular action but to the augmented activity of the heart, which improves the nutrition and promotes the activity of the kidney. At the same time, the increased power of the heart quickens the circulation in the lymphatic system, dropsical fluids are reabsorbed into the blood-vessels, and are excreted by the kidney.

These views of Cushny appear to fit in very well with the clinical results which we obtain from digitalis. We can see similar circulatory changes produced in other organs of the body—for example, the liver. In heart failure the liver is often swollen and engorged with blood, the patient is jaundiced, and bile appears in the urine. The condition is assumed to be one of hepatic venous congestion with deficient excretion of bile. When the cardiac efficiency has been restored by means of digitalis the hepatic congestion and swelling subside and bile is again freely excreted. We do not say that in such cases digitalis acts as a cholagogue, or assume that it has any direct action on the liver, although its action here is probably exactly the same as on the kidneys. Similarly, when the clouded brain is cleared, the œdematous lungs are relieved, and the stomach and intestines are freed from their congestion, we do not consider that digitalis has a special action on these tissues.

Another fact to be remembered is that digitalis has not been found to be efficient as a diuretic save in cases of cardiac dropsy. Its employment for diuretic purposes may be said to be confined to cases of cardiac disease with dropsy. Those who accept the view that digitalis is a diuretic because of its direct action on the kidneys must be prepared to show that there is some special condition present in the kidneys peculiar to cardiac dropsy. No such condition is known, and, in fact, in many cases when the congestion of the kidneys has been relieved the kidneys are found to be perfectly healthy.

Diuretic Action of Digitalis Alone and Combined with Theocine.

In many cases we can say with confidence that the dropsy will disappear when digitalis has restored efficient cardiac action. We do not understand fully the underlying causes of oliguria in cardiac cases, any more than we know the exact mechanism of cardiac œdema, but we can observe sequences in the treatment of dropsy. In my experience the diuretic action under digitalis is often of a sluice-gate character, in which some holding back influence has been removed and the excess of fluid is poured out through the kidneys. The time at which this is secured is more or less synchronous with the recovery of ventricular efficiency, and in the most typical cases this comes soon after the cardiac rate has been lowered. If, on the other hand, the cardiac rate has been and continues normal, and no appreciable change in the cardiac efficiency takes place under digitalis, we do not usually find much evidence of a diuretic effect.

In some cases we do not get the expected diuretic action of digitalis, even although it may have been effective in relieving the other symptoms. Something additional seems to be required to "tip the balance" and make the kidneys act. This may be accomplished by such means as a sharp purge or dose of mercury, or by partially relieving the dropsy by Southey's tubes, or it may be brought about by some such trifling alteration as a change of posture, as Mackenzie points out. He finds that "the kidney functions, when there is dropsy, are peculiarly unstable," and this is probably the common experience.

It will also be found that the caffeine series of preparations, when used along with digitalis, are at times very effective in inducing diuresis. I cannot specify the exact underlying renal conditions which are present. It has appeared to me that the theocine-digitalis combination has proved specially suitable in cardio-renal cases—that is, when both heart and kidneys are diseased. A most efficient preparation is theocine-sodium-acetate, and the action is often very striking. Unlike that of digitalis it begins almost at once, and may start within an hour of the first dose. If no effect is manifested within 24 hours or after 40 grains it is of little use continuing the drug. Theocine appears to act most effectively in combination with digitalis and after the patient has taken a sufficient amount of digitalis to affect the heart. While digitalis alone may procure a diuretic effect theocine alone is not usually effective if the dropsy is essentially cardiac in origin. The action of theocine is no accidental one, for it can be repeated in the same case, and its effect is so prompt that the element of chance can be excluded.

The diuretic action of digitalis in cardiac dropsy can only be estimated properly when the kidneys are healthy and merely disturbed in their function from circulatory weakness. If renal disease is present other factors may come into play which cannot at present be estimated. The diuretic effect under digitalis is not usually started until after 48 hours from the commencement of treatment. This of itself is suggestive of an indirect rather than a direct diuretic action. Mackenzie has noted in some cases the onset of diuresis within 48 hours of the administration of digitalis and before any effect on the heart was perceptible. He thinks "it is probable that the beneficial effect produced by the drug is

due to its diuretic effect rather than to its action on the heart." We have already considered some difficulties in the way of accepting this view. In several of his cases chronic renal disease was present so that they were not suitable for deciding the question at issue. Accepting his facts as to these exceptional cases, we may offer another explanation than the one he has given. Digitalis, amongst its other effects, has an irritant action on certain tissues which is more pronounced in some people than in others. Thus diarrhœa may follow quickly from the use of quite moderate doses. Cushny points out that digitalis may act as an irritant to the renal epithelium, as the appearance of blood and albumin in the urine of animals after large doses of digitalis shows. Mackenzie usually begins treatment with full therapeutic doses of digitalis, and the irritant action of the drug may have told on the kidneys before the cardiac action has had time to take effect. Such an action would not bring digitalis into the category of diuretic drugs, although it might explain the early diuretic effect in some cases of cardiac dropsy.

Action of Digitalis on Arterioles and Blood Pressure.

It was formerly held by pharmacologists, as the result of experimental work, that digitalis contracted the arterioles in animals and raised the blood pressure. These statements were accepted by clinicians as applicable to the employment of therapeutic doses of digitalis in man for heart disease. Further, warnings were given that owing to this action care must be taken in certain forms of heart disease lest it should react injuriously on a weakened heart. More recent pharmacological investigations have shown that digitalis has no such action on the blood pressure, which is affected only by the increased efficiency of the cardiac contractions. Cushny points out that there is a balanced action between the increased force of the heart's contractions and the tone of the vasomotor system. An augmented efficiency in cardiac contraction would lead to a rise in blood pressure provided that the blood-vessels remained unchanged in calibre. But as the output of the heart increases the vessels relax in proportion and the flow of blood is accelerated. This compensatory action arises in the vasomotor centre, and as long as it persists the blood pressure does not rise.

Cushny's conclusions have been supported clinically by the investigations of Mackenzie and his pupils. In what is perhaps the most important form of disease in this connexion—namely, auricular fibrillation—they found that no estimate of the blood pressure could be made, as it was constantly changing. In cases with a regular rhythm they could detect no appreciable effect upon the blood pressure. Digitalis and the blood pressure is still a subject of interest to senior students because of its value for examination purposes, but after the examination is passed the student may dismiss the subject and rest assured that its value to him from the clinical and therapeutic point of view is negligible.

"SOLDIER'S HEART."[1]

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IN considering the subject of heart affections as they are encountered in soldiers it will be desirable in the outset to say a few words about the term "soldier's heart," which has now acquired an accepted position in our nomenclature of diseases, one which certainly appears to supply a definite need in corresponding to a definite condition, but, unfortunately, also one which is employed with so much abuse that it is impossible not to regret that such a term should ever have been introduced. We ought to restrict its application to patients who are suffering from cardiac affections, or, at any rate, cardiac symptoms due in some way to military service. In this sense soldier's heart would be an occupation disease, as we speak of miner's nystagmus, scrivener's palsy, or housemaid's knee. But whereas there exists a special group of cases which in my opinion corresponds to such a restriction, even though the exact determining cause is still a subject for contention, the term is applied indiscriminately to a large variety of symptoms which are evident in men who happen to be temporarily khaki-clad and most of which have nothing whatever to do with the heart, nor, for that matter, with military service.

And this reminds me to refer briefly to that question-begging epithet which is so conveniently employed in these days, D.A.H. (disordered action of the heart). Now, whatever words of depreciation may be considered suitable to apply in the case of the aforementioned "soldier's heart" these fade into insignificance when you select those condemnatory enough for its blood-relation D.A.H. I do not hesitate to say that I have seen men complaining of symptoms referable to every disease above the umbilicus sent in as D.A.H., and I am not at all sure that a certain number below this anatomical landmark have not been included. But even if one eliminates those cases of so-called D.A.H. which pass the first portal re-labelled N.Y.D. (not yet diagnosed) and are finally discharged as N.A.D. (no appreciable disease), what exactly does an honest attempt to use the words involve? What precisely is orderly action of the heart and when does chaos usurp the place of cosmos in the circulatory world? And in the second place is it not absurd at this stage of our knowledge of the etiology of disease to imagine that a diagnosis of tachycardia *is* a diagnosis, or that it is sufficient to say that a pulse is irregular or intermittent without taking the trouble to see what is the nature of the irregularity and if, as a matter of fact, its existence is of the slightest consequence?

In recalling to your memory the copious literature which has already appeared on the subject of "soldier's heart" during the last couple of years, I would suggest to you that a large variety of different conditions have been at various times described as if they were all the same thing. And I think the best way to support this proposition is to enumerate a representative collection of the causes which have been advanced.

First and foremost very naturally is the endeavour to ascribe all cases to exertion. Here, then, is our old friend "strained heart" or "athlete's heart" in modern form. To adapt the condition to military circumstances such features are introduced as marches with weights, shoulder-straps, and the other paraphernalia of service and service kit. The subject of heart-strain I will postpone to consider later in detail.

As a sort of corollary to this school there is another which presupposes the existence of a great deal of latent unsuspected cardiac disease which only manifests itself in consequence of the strain, physical or mental, or both physical and mental, of military life.

To other authorities the condition is due to a toxæmia. If microbic influence is demanded—well, organisms are so easily introduced, from the teeth, for example, or from the food itself, and even if you are deprived of organisms there are always toxins to fall back upon. And if toxins likewise are denied, there are perverted products of metabolism, and some authors blame the excessive protein diet of the soldier.

Another large group of authorities attribute the condition to the thyroid gland. The majority of these think there is hyper-thyroidism, though a few believe the secretion to be normal in quantity, but of pathological quality. The soldier's heart to this school is simply larval Graves's disease.

At least every other week somebody writes to the medical journals explaining "soldier's heart" to be due to excessive cigarette-smoking, and considering the almost universal prevalence of this vice such an opinion has at least the support of reasonableness.

Recently "soldier's heart" has been attributed to deficiency of buffer-salts in the blood, and such an explanation is not without its inconvenience in view of the difficulty in technique in estimating these salts, more especially as I will be impertinent enough to hint that the majority of us are more than vague as to what a buffer-salt is, what it does, and why its absence should produce symptoms of cardiac disease.

One turns next to an entirely different interpretation of "soldier's heart" in introducing the school which supports a psychical origin. Its disciples see no necessity to invoke the existence of any organic pathological cause. In fact, they see no necessity to suppose the existence of any sign of heart disease. They point out that the symptoms, although equally familiar in genuine heart trouble, are quite easily or at least speciously, explainable on a non-organic basis and that a

[1] A paper read before the Connaught Hospital Medical Society.

man who has hitherto adapted himself to the most sedentary life, suddenly forced into the activity of unaccustomed exercise, pants and puffs and finds it much easier to sit down than to try to keep going. The symptom of præcordial pain in such cases is generally indigestion due to bad teeth.

Now it seems to me that every one of these explanations is probably right—that is to say, that among the enormous number of cases one meets in the Army with symptoms of breathlessness on exertion, of præcordial pain, and of general so-called cardiac distress there are some which may be explained in every one of these ways. And if I may venture to criticise those of far greater experience to whom we look for guidance, I think they have often made the mistake of laying too much emphasis upon the particular condition they are describing to the exclusion of absolutely all else, and unconsciously, and of course unintentionally, giving the impression that they were dealing with the whole of the cases comprised under "soldier's heart."

I hold the view that the large majority of cases which are labelled "soldier's heart" and condemned as unfit for active service have a perfectly normal myocardium and suffer from symptoms which have no organic basis. I would, then, suggest to you that we may classify the cases which are sent up to us with symptoms or signs which might be referable to the heart in the following way:—

1. Functional cases. A large number of men at the outset of their military duties who are free from any organic disease, but who have hitherto been quite unused to any form of exertion and readily display symptoms of distress or of fatigue.

2. Cases with symptoms due to excessive smoking or other drugs and disappearing upon appropriate treatment.

3. Organic disease: (*a*) Valvular disease (1) compensated, (2) uncompensated; (*b*) myocardial disease; (*c*) adherent pericardium; (*d*) Graves's disease.

4. Genuine soldier's heart.

I shall not deal with these groups seriatim, but I shall refer to them indiscriminately in considering general principles.

The first general principle with which we should be concerned is the fundamental question of so-called *over-strain of the heart*. I would mention in passing that Sir Clifford Allbutt points out that this expression is tautological since all strain must be overstrain.

When one has the support of Sir James Mackenzie one need not hesitate to state dogmatically a disbelief in "heart-strain" or "athletic heart." As a matter of fact, on purely empirical and not clinical grounds I never have believed in it; but it is one thing to state what is regarded as a worthless opinion based on inexperience and differing from common acceptation, and another to express a point of view which receives the cachet of the doyen of cardiologists. And Sir James Mackenzie says of "athlete's heart":—

> "Personally I have never seen such a thing and, when my opportunities of observation are considered, I think it will be allowed that I would have seen it if it had really existed." He says further: "I have had brought to me great numbers of young people of both sexes with hearts said to have been impaired by overstrain. I have not found a single case of dilatation with heart failure. That dilatation can be produced in a healthy heart as a result of overstrain, more particularly among the young and athletic, is a belief widely held. I am convinced that it is a view which is not justified. I never saw a single individual who suffered from heart dilatation as the result of over-exertion. I think I may fairly say that this was not due to inability to recognise overstrain."

With such a sentiment as the last is there anybody who will disagree?

I cannot lay claim to an experience which would justify me in the presumption of endorsing an opinion of Sir James Mackenzie, but I can at least claim a special experience which is in its way even greater than his. For eight years there has been practically no prominent athlete in any country in Europe (and a good many from the colonies and from America) whom I have not had an opportunity of examining before and after exercise. I have been hunting the "athletic heart" all this time in sprinters, middle-distance runners, Marathon runners, and I have never caught it.

And yet, it will be urged, our eminent predecessors published cases of dilated heart and overstrain which were clearly the result of exertion. In some cases a comparatively recent antecedent infection is definitely stated, in others it is hinted at. And in others, again, a coincidence is well worth noting that both Sir Clifford Allbutt and the late Sir Lauder Brunton describe cases of acute dilatation occurring during mountain climbing. Now the physiology of high altitudes is rather queer in itself; a large increase in red corpuscles has been shown to occur, and it is quite possible that by mere mechanical friction they retard circulation to some extent.

A priori there should be no expectation of the heart failing through pressure of work any more than of a diaphragm becoming fatigued. Nature is not likely to jeopardise the well-being of the most important muscle in the body but safeguards it by ensuring that everything else shall give in first. When a man is badly done up as the result of a big effort it is not cardiac failure but vaso-motor exhaustion from which he is suffering and his symptoms are due to nothing more serious. Personal experiences, however feeble, have at least a certain peculiar merit which is my excuse for obtruding these. During 16 years of practically continuous competitive athletics I have known frequently what it feels like to be badly run out or rowed out, but I remember only two special instances which stand out prominently. On the first occasion I had won a particularly hard 200 yards race and I can only attribute the nausea, dyspnœa, and dreadful headache from which I suffered the rest of that day as due to an extra effort induced by an exceptional keenness to win. Had I sought advice for my symptoms I might still be in bed or just beginning graduated exercises, but as this was the middle of a big athletic season I determined to adopt the best form of investigation I could think of, and the following morning I went out and ran, with very great relief to my doubts, one of the finest quarter-miles I have ever run. The second occasion was six years ago. Starting from Grindelwald, I went up the Faulhorn and down practically without a stop in four and a half hours. One hour after I had reached the bottom I began to experience intense nausea, and I fainted. I believe that these symptoms were due to the exhaustion from want of food. Once again alarm demanded a critical investigation, and 48 hours later I went up the Faulhorn as hard as I could go; but on this excursion I ate a good déjeuner, and rested for an hour at the top before running down, and I had not the slightest symptom of distress of any kind.

It is easy to understand how soldiers on the march faint, especially in hot weather, when their peripheral vessels are dilated to such an extent as to deplete the brain. Of course, some people are much more liable than others to these attacks from the particular tendency of their blood to drain into the large abdominal veins. Such attacks, too, are largely precipitated by the boredom of a march. The fatigue of disheartenment is a very well-recognised thing.

I put it to you that physical exertion is mainly a matter of will-power. Some men have the will to drive the engine harder than others. But, granting no flaw in the machinery, nobody can drive it to breaking point.

In the consideration of *organic disease of the heart* we have first to deal with the question of *cardiac murmurs*. Sir James Mackenzie says:—

> "The presence of a murmur is often considered to be inconsistent with the idea of a healthy heart, and the great bulk of the profession and the teachers of the profession do adhere to this view." Further, he says: "Every graduate leaves hospital with but the vaguest notion how to assess the value of a murmur."

I think I may assert that there is not one of us here who does not almost every day see at least one striking example of the absurdity of worrying about the existence of a murmur qua murmur, a survival of student days when prolonged arguments were wasted upon the exact timing of some miserable squeak, to say nothing of the decision whether there was any murmur there at all. As a consequence we gained the impression from our teachers that the slightest alteration in the character of the heart sounds meant serious organic cardiac mischief, and the fruit of this teaching has been, in civil life, the obstacles placed in the way of such people ever getting insured, and in military life the wholesale rejection of perfectly healthy subjects physically fit for anything; so depriving the country of a number of efficient soldiers, and, what is even worse, condemning to a serious restriction of useful and wholesome

activity many men who for the rest of their lives walk about gingerly with the sort of sensation that they have a bomb inside them and with the perpetual dread of sudden death.

Now so long as the heart does its work properly what does a little music in its mechanism matter? Some motor engines purr, others bark, and others roar, yet all may be equally efficient; and the murmur in the heart may bear no more relation to the heart's capacity for work than, to continue the parallel, need a squeak in a spring have anything to do with the engine.

Many murmurs are, of course, not cardiac at all, but due to pressure relations of the pulmonary artery and the chest wall or to some other simple extra-cardiac cause. The distinction of physiological murmurs is usually quite easy if one is not wedded to the idea that heart disease is so common that it must always be suspected. And although organic murmurs must in any case denote a certain degree of disability, even organic murmurs are not necessarily of much consequence. As a convenient rule, Sir James Mackenzie has said that a systolic apical murmur may always be disregarded when there is no sign of enlargement of the heart, for, as he says, "if a murmur is caused by a lesion which embarrasses a chamber in its work, that chamber will alter in form either by dilating or becoming hypertrophied." So that to talk of V.D.H. (valvular disease of the heart) as a definite condition always calling for discharge from the Army as permanently unfit is quite unreasonable. To put it in the terms of a common pleasantry, there is V.D.H. *and* V.D.H. The heart's capacity for doing work is the vital criterion, and I am quite sure that many cases of well-marked valvular disease are little, if any, handicapped by their disability.

The heart muscle is, of course, the great factor in cardiac efficiency. If we could always measure the quality of the muscle we should find it easy to estimate the general condition of the heart, and the discovery of myocarditis with corresponding prognosis would be a simple matter. But a person's description of his inability to exert himself is, in my opinion, a very poor guide, although, as you are well aware, more than one cardiologist has stated that we are to accept a complaint of pain, dyspnœa, giddiness, &c., as absolute evidence of cardiac disability, even in the absence of abnormal physical signs in the heart.

As aids in estimating the cardiac efficiency, various tests have been elaborated—e.g., Grapner's; and various instruments have been invented, such as the Bock stethoscope, the application of which has been particularly encouraged of recent date by Dr. O. Leyton. The tests depend upon the differences observed between the pulse-rates and blood pressures in the resting state in the horizontal and erect positions and in the reaction to exercise. The Bock stethoscope is an arrangement which gives a numerical value to the audibility of the first sound at the apex and the second at the aortic base. A heart with normal musculature yields a ratio of 60 : 40. The nearer the ratio approaches unity the more the myocardium is pathologically affected. We have used the instrument fairly extensively here, and have come to the conclusion that it has a useful application. The chief difficulty in our experience is the necessity for absolute silence during observation, otherwise the error may be so great as to render the result quite useless. The instrument is said to be inapplicable when murmurs are present.

It is unnecessary to deal with the well-known signs of obvious cardiac distress—e.g., cyanosis and œdema. It might be thought that *dyspnœa* is equally obvious as a sign of cardiac inefficiency, but in this sign there is the possibility of a large functional element. The majority of the ill-fed, flat-chested, poorly developed men who enter the Army after an uneventful sedentary life and are then plunged into what is to them unalluring strenuous activity naturally puff and blow and complain of pain in the chest. Again, the dyspnœa of what I call a case of real soldier's heart is often an hysterical polypnœa and calls for vigorous physical and mental discipline.

Pain on exertion is, again, a very vague symptom. The pain complained of by false cardiopaths is usually præcordial and not substernal as in true angina, and the pain does not radiate. It often disappears after effective dental treatment, and especially if the man can be persuaded to overcome the inevitable distress of his first exertions and persevere. But once let a man get the idea that he has a weak heart and any hypochondriacal "pain in his heart" speaks to him of sudden death. Speaking generally, we do not think of cardiac disease as associated with pain in the chest and when a man complains thus of his heart one is justified in thinking of his stomach.

It is one of the most important and often one of the most difficult things to decide the meaning of a *cardiac irregularity*. The general tendency is to regard any divergence from a perfectly regular rhythm as evidence of cardiac disease. But, on the contrary, some forms of irregularity are of no pathological importance whatever; indeed, one form, sinus arrhythmia, is even stated to be a particularly good sign that the heart is normal, a sort of hall-mark of a healthy heart. On the other hand, there are types of irregularity which give an absolute indication of serious myocardial change and their determination is far more useful than that of the size of the heart or of any murmur.

Sinus irregularity is a variability in the intervals of diastole. It can be produced in susceptible subjects by stimulating the vagus centre—e.g., by swallowing or deep breathing, for it is related to irritability of the centre. It can be completely abolished by exertion. Such an irregularity is, as I have said, of no pathological importance.

Extrasystoles, or, as they are more correctly termed, *premature contractions*, are recognised by the circumstance that the "extra beat" anticipates a regular contraction and is followed by a longer pause than after an ordinary beat. It is the long pause which is so unpleasantly apparent to the subject himself. Extrasystoles are often of no pathological consequence, and can be abolished by exercise. On the other hand, they may indicate myocardial disease. They constitute, therefore, one sign only which has to be taken into consideration with all the other cardiac phenomena.

Pulsus alternans is a condition in which alternate beats are of unequal volume. It is a very grave sign of myocardial disease. It is obvious that some care is necessary to distinguish this condition from one in which premature contractions occur after every full beat. In the latter there is always a longer pause after the weaker (the premature) beat. In pulsus alternans the beats are regular and the intervals equal.

Auricular fibrillation is a condition of irregularity in which beats vary in frequency and volume in a completely irregular manner. It is not decreased but generally increased by exercise, and it is a sign of serious organic disease.

Heart-block, in which the rhythm is disturbed at regular intervals by the dropping out of a beat, is always a sign of serious heart disease.

Whilst it is the rarest possible thing for a soldier to be sent up as D.A.H. with *bradycardia*, the number sent up as *tachycardia* far exceeds the total of all the other cases (I mean by tachycardia simply undue acceleration of the rate, whilst I would remind you that some authorities restrict the term to a special type of acceleration—paroxysmal tachycardia). Now to speak of tachycardia as a distinct condition, when it may be due to such diverse causes as acute peritonitis and drinking too much tea, is as absurd as to label a case abdominal pain when this symptom may be due to indigestion, appendicitis, caries of the spine, pneumonia, or a host of other things. In the first place, some people appear to have a physiological tachycardia and own a heart which runs normally at 110 perhaps and gives rise to no symptoms. When a patient complains of the usual cardiac symptoms it is clearly necessary to exclude all organic causes of tachycardia—e.g., tuberculosis, valvular disease, myocardial degeneration, adherent pericardium, Graves's disease, and any obvious functional cause, such as excessive smoking. We are then left with a residue of cases about which it seems impossible to decide, in whom there is nothing definitely organic unless you invoke larval Graves's disease. In this type of case there is, of course, no exophthalmos and no enlarged thyroid to aid the diagnosis, but the presence of tachycardia, of tremors, and of nervousness justifies one in diagnosing, according to inclination, larval Graves's disease or a neurotic condition with, as Sir Clifford Allbutt puts it, "a diffuse assemblage of mere accelerations."

And this brings me finally to what I think may legitimately be called *soldier's heart*. I premise as the patient a man who really has been a soldier and exposed to the vicissitudes of warfare. Is the influence of warfare, physical strain, toxin, or psychic trauma? The factor of strain I have done

my best to eliminate. A few words will deal with the other possibilities that have been raised. The patient presents symptoms generally of dyspnœa, always of fatigue on slight exertion, lassitude, persistent tachycardia without cardiac enlargement, and perhaps a variable number of neurotic manifestations. There is invariably a history of psychic trauma—it may be one acute occasion or a long-continued bombardment by greater or smaller shocks.

These are the cases for exhaustive investigation, for the detection of toxins, for the estimation of buffer-salts, for the consideration of the balance of the ductless glands, for inquiry into the previous psychical history.

It is unsatisfactory to invoke toxæmia, for surely this factor can never be eliminated and must play a part more or less in the production of any morbid state. The system is probably in a condition of auto-intoxication whenever it falls a victim even to psychic disturbances. In some of these cases the antecedent history clearly exhibits the presence of some infection—e.g., influenza, dysentery, or toxic state, such as constipation or some other cause of auto-intoxication. In other cases it does not.

As regards the ductless glands, I do not see how it is possible to deny or to prove their influence in this condition. What is the effect of their secretions upon the emotions? What is the influence of the emotions upon their secretions? Suppose the psychic disturbance does lead to some alteration in the glands, to the production, for example, of hyperthyroidism. Are we to suppose that such alteration is the principal result of the shock and that treatment directed to the gland will relieve symptoms? I personally have never seen the slightest benefit derived from this or, for that matter, any other form of treatment.

There is, it seems to me, a great deal to be said in favour of a purely nervous origin. In the first place, a very large proportion of sufferers are of a distinct type of mentality, men with shallow reservoirs of nervous energy—the neurasthenic soil, in fact. I yield to nobody in my admiration of the spirit which has animated the majority of sufferers from "soldier's heart" and all other forms of war neurasthenia when I describe them in this way. The symptoms correspond to a failure in vaso-motor and cardio-inhibitory control. The obstinate resistance to any form of treatment supports the idea of a nervous origin, a shock to the nerve centres which persists who can say for how long It is a very striking feature that men who sustain a definite somatic injury do not manifest "soldier's heart," nor any other presumably nervous symptoms. In these cases of injury the immunity of the nerve centres to shock may be explained by the dissipation of the shock elsewhere, as the delicate works of a watch are spared in an accident in which the glass is smashed. It may even be explained, without detriment to the hypothesis of neurosis, by the mere circumstance of an injury having occurred satisfying the subconscious with the realisation of something definite, and not presenting to it only the sensation of some vague disturbance, the uncertainty of which prejudices recovery.

Reviewing, with not unnatural pessimism, the persistence of symptoms, one cannot help thinking that only termination of hostilities could cure these sufferers, in whom with the best of intentions there must continue to run a subconscious current of defence-neurosis telling them that recovery means a return to the hell from which they have escaped. Treatment of such cases appears to have the sole effect of perpetuating their neurosis by fixation of the attention, although whether immediate vigorous treatment of them as of purely neurotic origin would yield better results we here have no opportunity of observing, since the cases we see are, so to speak, chronics who are left in statu quo after a great deal of practically every form of therapy that has been recommended. As we see them, at any rate, such cases are of no further use for general service, but given sedentary work they continue on a low level of activity with the tachycardia and other symptoms unrelieved, but, so far as we can see, executing very light duties with comparative cheerfulness and apparently without any ill effects.

ST. AUSTELL (CORNWALL) BOARD OF GUARDIANS AND THE TREATMENT OF ADENOIDS.—At the last meeting of the St. Austell board of guardians it was decided that Dr. A. Shaw should operate upon children requiring the removal of adenoids at a fee of 1 guinea per patient.

IMPORTANT PRINCIPLES IN THE DRAINAGE AND TREATMENT OF WOUNDS.

BY WILLIAM PEARSON, F.R.C.S. IREL.,
MAJOR, R.A.M.C. (TEMP.).

With Remarks by P. J. FREYER, C.B., Lieutenant-Colonel, I.M.S. (R.), Consulting Surgeon, Eastern Command.

AN experience of more than two years of war surgery, with considerable study of its literature, has convinced me that no general agreement in the principles of wound treatment has yet been reached amongst surgeons. My time has been spent first in France and subsequently in England, and several thousands of cases have passed through my care, so that I feel I can speak with some authority on the behaviour and progress of various types of wounds in both their early and later stages. This dual experience is, I believe, of value in helping one to form a clear judgment on the merits of different lines of treatment, because it has appeared not infrequently that the views of workers in France and of those in this country are at variance; and it has been suggested that these differences are due to the different conditions under which the work is performed, or rather to the different stages in the life-history of the wounds at which treatment and observations are carried out, so that both may be right, and what is sauce for the goose is *not always* sauce for the gander. I do not believe that this is a satisfactory explanation, as the general lines on which I was working when I left France two years ago are, with slight modifications, those that I still employ with excellent results. The modifications have not been changes of principles, but rather a further advance on the same lines.

Naturally a very large amount of the work and literature on wounds has been devoted to the questions of infection and sepsis and their treatment; and it is not uncommon to hear it said that our ideas on these subjects were previously all wrong, and that we have had to change both ideas and methods entirely. Infection and sepsis are no new things; the differences between them as seen in war wounds and in civil practice are differences of degree and character only, so that if the previous statement is correct it follows that heretofore surgeons have been working on altogether wrong principles in dealing with them. But this is manifestly incorrect, as evidenced by our enormous strides in dealing with intra-abdominal infections, to take only one example. "*Ubi pus, ibi evacua*" is a surgical maxim which is as generally accepted as it is old, and all surgeons are agreed on the necessity for drainage in dealing with sepsis.

Claims as to Value of Antiseptics and Concentrated Saline.

Concerned with this question of drainage are two schools—I had almost said factions—which hold different views as to how drainage may best be aided in subduing infection. The members of one, which may be termed the "antiseptic school," pin their faith to the use of antiseptic solutions by which they believe they can rapidly diminish or destroy the organisms *in situ*, and thus subdue the sepsis and even render the wound sterile. The doctrine of this school amounts to an admission that by drainage alone they are unable to effect satisfactory results—in other words, as I shall indicate presently, that their drainage is faulty or inadequate. The weakness of their position is indicated by the truly astonishing number and variety of antiseptics which have been advocated for this purpose in the medical press of the past two years. From amongst them the hypochlorite group, exemplified by "eusol," may be taken as being the most fashionable at the present time.

The other school, ably led by Colonel Sir Almroth Wright, may be called the "concentrated saline school." It maintains that by antiseptics it is impossible to destroy all organisms in the wound once infection is established short of destroying the tissues themselves, and that infection and sepsis are best combated by promoting free secretion into and discharge from the wound, making use of a concentrated saline solution for this purpose. Whether this acts by osmosis or in some other way is really immaterial to the issue, provided it is *effective and necessary*. The solution advocated by Sir Almroth Wright is

one of sodium chloride 5 to 10 per cent., and it has been enthusiastically supported by many surgeons both in this form and in its modification known as the "salted pack," which consists of a gauze pack in which are incorporated soloids of sodium chloride. While fully appreciating the value of Sir Almroth Wright's work, and recognising that through it he has been demonstrating and emphasising the importance of drainage, the lessons to be learnt by practical surgeons have, I believe, become somewhat obscured by the undue prominence given to the rôle of the concentrated saline, both in his writings and in those of other supporters. Indeed, that this is so was made manifest to me by the remark of a distinguished surgeon, when discussing with me the "salted pack" and advocating its merits a year ago. He said: "It is extraordinary the way it works; it seems to have a remarkable instinct in causing a profuse discharge in the very cases in which it is necessary, and causing very little in others where it is not required." Assuredly, the "remarkable instinct," prompted by the organisms, was exercised by Nature and not by the salt in the pack.

Unfortunately the brilliant advocacy of "concentrated saline," and more recently of "eusol," has possibly done harm. I am convinced that through it, in the minds of many, the main issue has become obscured, and that the paramount importance of good mechanical drainage has been lost sight of. It is, even still, not an uncommon thing to receive a patient, whose wound is in a bad state of sepsis and most inadequately drained, adorned with a label on which one reads, "washed out with concentrated saline twice daily"; "irrigated with Wright's saline every four hours"; "treated with salt packs"; or, "treated with eusol—wounds now beautifully clean." I quote from actual cases received under my own care; the latter case in particular I remember for its cheery optimism, as it was what I would describe as "full of sepsis." I am fully aware of the magnificent surgical work that is being done in France, of the very difficult conditions under which it is often performed, and of the fact that these cases had probably not been dressed for 24 hours when we received them. I only instance them to show that in the minds of some, at least, the value of good mechanical drainage is not fully appreciated, and the use of concentrated saline or the latest fashionable antiseptic is given the seat of honour.

Importance of Free Mechanical Drainage.

Two months' work in France at a base hospital sufficed to convince me that the use, in a wound, of the antiseptics which were then in vogue was valueless in subduing infection at the time when this was the all-important indication for treatment. I became convinced that the secret of success lay in free mechanical drainage; nor have other measures since advocated, and which I have given a fair trial, caused me to change my opinion.

It is, of course, universally agreed that sepsis cannot be dealt with adequately either by antiseptics or concentrated saline if unsupported by drainage; but it is not, I think, generally recognised that wound infection can be thoroughly and efficiently controlled by mechanical drainage without the use of either of these aids in the wound itself. And yet I am convinced that this is so, and that the results are equally prompt and satisfactory. Of such paramount importance is good free mechanical drainage, that when this has been properly established it is a matter of indifference whether we employ antiseptic solutions or concentrated saline as an aid, and the value of either is so subsidiary as to be negligible. I will not assert, as some have done, that they are injurious—I have formed no definite conclusions on this point—but I do say that they are unnecessary. The greater my experience in wound treatment the more I am convinced of the truth of this, both from my own personal observations and from my knowledge of the work (sometimes in an opposite sense) of others. *Mechanical drainage is the essential factor* in the successful treatment of infection, and success will be directly proportional to the *mechanical* efficiency of the drainage. The question which every surgeon should ask himself, when faced with a case which is not progressing satisfactorily, is, "What is wrong with the drainage system in this wound?" Almost invariably the answer will supply the key to successful treatment, if we exclude, of course, cases of severe systemic infection, gas gangrene, and so on, which fortunately form only a small proportion of our cases. Even these will become greatly reduced in number by the early establishment of adequate drainage.

Unfortunately we meet here with the difficulty of the personal equation in the surgeon: what one may regard as adequate another may think quite insufficient. But it may help somewhat to state that *what is sufficient drainage in the common infections of civil practice is usually totally inadequate when dealing with a wound infection of similar magnitude*, and that it is impossible to over-drain. Indeed, as a general rule, the freer the incisions the more quickly and satisfactorily is the wound healed, a fact which is not apparent at first sight.

Numerous cases might be quoted where, in spite of weeks of treatment, progress was being retarded or the patient going steadily to the bad from want of mechanically efficient drainage; but it will be more to the purpose to point out the more common faults in drainage as I have observed them. They are: 1. Insufficiently free incisions. 2. Drainage against gravity, without counter-openings, especially in thigh, arm, and shoulder cases. 3. Too small, improperly adjusted, or improperly used drainage-tubes. 4 Mechanical obstructions within the wound, such as small or valvular openings from "pockets," hernial protrusions of lacerated tissue (especially muscle), foreign bodies, bone fragments and débris, *tight* gauze packs. 5. Obstruction external to the wound, such as tight bandages, pressure from splints, bedding, &c.

In the vast majority of cases the complications and sequelæ of sepsis may be avoided by the institution of timely drainage on sound mechanical principles; and their occurrence should usually be regarded, not as "bad luck," but as an indication that in some way or another the drainage system has been at fault.

Mechanical Principles Involved in Drainage.

Recognising the paramount importance of drainage, and remembering that from an operative point of view it is merely a mechanical problem, our efforts to render it efficient must be directed in accordance with simple physical laws. Though these are well known, I wish to consider them briefly with special reference to their practical application to projectile wounds. The chief factors governing the efficacy of drainage are then: (1) Absence or reduction of resistance to outflow; (2) gravity; (3) capillary action. The first two of these are closely connected.

1. The freer the exit the less is the resistance offered to the escape of discharges from the wound. This shows the necessity for *free* incisions in dealing with infection, particularly in deep wounds. Our aim should be to convert these into cone-shaped openings, the base of the cone being situated at the surface, so that free exit is obtained from all parts of the wound; pockets and tracks should be thoroughly opened up; "tunnels" should usually be laid open throughout unless anatomical considerations forbid; obstructions within the wound should be removed, so that good access and free exit are established throughout. The necessity for extensive surface openings is *very much greater in the case of infections in projectile wounds than in those of civil practice*, so that it is evident that there is something more than the mere question of free exit involved. The explanation is to be found, I believe, in the nature of the infecting organisms, which usually contain large numbers of anaerobes in the former.

Free drainage in the wound itself will not avail if the outflow is obstructed externally, and therefore attention should always be paid to this matter. Dressings should not be applied tightly, splint pressure must be carefully avoided, and the patient must be disposed in bed in such a way that no pressure is exerted over the wound. These are points which are frequently neglected, and it is difficult in the course of a paper to frame rules for every case. Briefly, however, I may point out that wounds in the posterior surfaces of thigh or leg should be treated by slinging the limb from a Balkan splint or leg cradle; in back and buttock wounds the patient should be placed on a "spinal bed" or framework with removable canvas "slats," so that pressure against the wound may be avoided—failing such an apparatus the patient should be kept in the lateral rather than in the dorsal position; wounds of the upper limb may often be conveniently treated by suspension in a Thomas' knee-splint or from one of the more elaborate devices.

2. The value of gravity and the use of counter-openings as an aid to drainage are not, I think, sufficiently appreciated in practice. This is particularly so in cases of wounds on the front of the thigh with, perhaps, a compound fracture of the femur. In these it is not uncommon to find, even after weeks of treatment, that the only exit is an overflow, that the whole wound is a foul cesspool of pus which has tracked extensively in the limb, and that there is widespread necrosis of the bone and complete absence of union in the fracture. Such a condition can easily be avoided if in the first instance, no matter how free the anterior opening may be, a good counter-opening is made into the deepest part of the wound—preferably, in thigh cases, from the postero-external aspect of the limb.

In extensive wounds with much laceration of tissue it will frequently be necessary to make several counter-openings to deal with different recesses or "pockets," but the surgeon should have a definite purpose in view for each opening he makes; it must never be made by "rule of thumb" but to suit the exigencies of the particular case. The efficient drainage of each individual wound is a problem in itself which should be governed by definite principles indeed, but the details of which depend on the exact characters of the wound. Often it is a simple matter and can be determined at a mere glance; at other times it becomes one of great complexity and cannot be solved without thorough digital exploration and inspection of the wound on the operating-table. Even then anatomical considerations may prevent one from following the most efficient mechanical plan, and one has to adopt something less. But what I wish to emphasise again is that *no other measures which we may employ will adequately replace a mechanically perfect system of drainage.*

3. Capillary action, though of less importance than free exit and gravity, is also a valuable mechanical aid in promoting drainage; it literally "draws" the discharge. In employing gauze wicks and packs for this purpose it is important to observe the following points:—

(*a*) The gauze should extend into the various parts of the wound, which should be filled up evenly and with but moderate pressure throughout; it should constitute what I term a gauze "fluff," and not a tight pack.

(*b*) Dead spaces should not be left within the gauze or between the gauze and the walls of the wound, as they will favour stagnation and decomposition of the discharge and form an excellent culture-ground for bacteria.

(*c*) In order to maintain capillary action it is necessary to prevent water-logging of the gauze drain. Hence we should allow evaporation to take place, and should never employ a waterproof covering over the dressing during the period of profuse discharge. For this reason, too, external dressings of gauze will be much better than close substances such as lint. The time-honoured boric fomentation is to be vehemently condemned at this stage, as it rapidly becomes merely a pus poultice, but unfortunately its use is still common. Copious coverings of wool and the application of firm, heavy bandages should similarly be avoided except for purposes of transit. The use of large quantities of wool for the purpose of soaking discharge should also be condemned on grounds of economy, as much of the wool now in use is anything but absorbent, and discharges merely track along inside the dressing to find their escape in the bedclothes. If the external gauze dressings become saturated they should be changed immediately.

(*d*) It is in the acute virulent stage of infection, when the discharge is usually profuse and serous in character, that capillary action is an effective aid to drainage; it is of no value when discharge is thick and purulent. If gauze packs are used then, and if discharge is profuse, they become clogged with secretion in a short time, and acting as foreign bodies merely delay the cleansing of the wound. This does not mean that gauze packs should never be employed in the later stages of wound treatment. They have very important uses then, too, but chiefly not for drainage purposes. Space does not permit of dealing with these uses here.

Incidentally I may remark that if a wound is thoroughly cleansed of foreign material and dead tissue and efficiently drained on the lines indicated, the change in character of the discharge from thin serous to thick purulent is accompanied by such a diminution in amount that there is no stage in which we find a *profuse purulent* secretion. The occurrence, and particularly the persistence of the latter, should always lead one to suspect either a foreign body, dead tissue (especially bone), or defective drainage. Indeed, many flesh wounds treated on these lines clean up rapidly within a week, so that it is difficult to say that there has been any purulent stage, and they may readily be closed by secondary suture or strapping with adhesive plaster.

Aids to Mechanical Drainage.

1. *Uses and abuses of drainage-tubes.*—A drainage-tube should be employed where a dead space cannot be avoided by gauze packing, or where dead tissue is present whose complete removal is inadvisable during the early stages of infection (e.g., most compound fractures), so that a prolonged period of free discharge is anticipated. The tube should lead down to this point, and it may often lie conveniently in the midst of the gauze packing, so that it does not come into contact with the walls of the wound. It must, however, act in the direction of gravity, if possible—through a counter-opening, if necessary. Through the tube a gauze wick may be introduced with advantage while the discharge is serous in character. Occasionally it is useful to keep both tube and wick long, so that they project for some distance from the wound and in this way exert an increased syphonage or suction action on the discharge and convey it to a convenient receptacle.

In *deep* wounds where neither dead space nor necrotic tissue exists, but where the escape of discharge is in an upward direction, a tube should be led through a dependent counter-opening into the deepest part; or the wound may be enlarged in such manner that gravity no longer hinders but will favour drainage. Where neither measure is feasible a tube should be led directly through the wound to its deepest part, and through it discharge should be aspirated as it accumulates.

Tubes are also useful for purposes of irrigation in deeper parts, particularly in comminuted fractures with necrosis, where there is always some tendency to retention and decomposition of discharge between the bony fragments. Here, unless the exit is exceptionally free, it is convenient to employ two tubes—one for injection and the other for return of the fluid. These may lie side by side (the "doubled-barrelled" tube) in the wound down to the fracture, but are often more efficacious when introduced from opposite sides—one through a counter-opening. In this way accumulated stale discharge can be washed away thoroughly at frequent intervals.

Another use for drainage-tubes, apart from treating infection, is in maintaining the patency of openings in the soft tissues when they show a tendency to close too quickly to permit of sound healing in a deeper part. Examples of this in connexion with bone cavities of moderate size, after necrosis has been eradicated, will not infrequently occur and need not be alluded to further.

Care must always be taken to select, trim, and insert a drainage-tube to suit the particular requirements of the case. Within limits, the larger the bore of the tube the better. The tube should be introduced *down to* the area to be drained, but *not through it*—the importance of this has been previously pointed out by Colonel H. M. W. Gray.[1] Great care must be exercised to prevent the end-opening of the tube from being occluded by contact with tissue, and a useful method to prevent this is to cut it in a "fish-tail" manner. Superfluous side openings should never be used, and the practice of employing tubes in which these have been made previously haphazard by the theatre sister is to be condemned. When cutting a side opening there should always be some definite purpose in view, such as the escape of discharge from some more superficial plane or area, and it should be placed accurately at such level and in such direction as will ensure its efficiency. It is common to meet with cases of through-and-through wounds of the thigh, arm, or leg, with considerable laceration of muscles and a severe comminuted fracture in which the only attempt at drainage has been the insertion of one long drainage-tube right through the limb and fracture, with a few lateral openings cut anywhere and lying anyhow up against the walls of the wound. This plan is never efficient, and should not be adopted.

The danger of pressure necrosis from a drainage-tube must always be remembered. For this reason tubes must

[1] Brit. Med. Jour., Jan. 1st, 1916.

never be a "tight fit," either a smaller tube must be used, or, more frequently, the opening should be enlarged. It is always advisable during the acute stages of infection to insert gauze between the tube and the surrounding tissues. On no account should a drainage-tube be left in contact with the wall of a blood-vessel; otherwise secondary hæmorrhage is almost a certainty. Contact with nerves, ducts, and other important anatomical structures should also be avoided.

Superfluous drainage-tubes should not be employed, and as soon as a drainage-tube has fulfilled its functions it should be discarded. It may seem unnecessary to say this, and yet there appears to be an idea amongst many that a drainage-tube in a septic wound, even if it is not doing much good, is at any rate not doing any harm. There comes a time in the treatment of every wound when the retention of a drainage-tube *is* doing harm: a tube is at all times a foreign body, and thus its presence is injurious unless the advantages derived from it outweigh its disadvantages. Its primary use in infections is to maintain a free exit for discharges until the infection has been subdued sufficiently to enable us to dispense with it. Its presence may retard as well as favour healing. More than once I have seen a tube retained in a long narrow track which for weeks past had been "crying out" to be allowed to close, and the removal of the tube resulted in complete healing in a few days.

2. *Exposure to air.*—The advantages of loose dressings and their exposure to the air to prevent saturation and stagnation of discharge and to favour drainage by capillary action have been mentioned already; but exposure of the wound itself is sometimes of special value.

In the early stages of severe infection, when first a wound has been opened up, I have sometimes found it advantageous merely to cover the wound with one or two thin layers of gauze, which are laid *evenly in contact with the surface all over*, and to use a bed of dressings on to which the discharge runs. This is best suited to widely gaping or open wounds such as the raw ends of septic "chopped-off" amputation stumps, and I know no method by which they clean up and become covered with healthy granulations more quickly. Presumably, in addition to the continuous and thorough removal of all discharges, this method has the advantage of combating anaerobic infection very effectively, and I have termed it the "local open-air treatment." I frequently adopt this method also for a few days in the later stages of treatment as a preliminary to secondary suture and skin-grafting, and I believe it is of real value.

3. *Irrigation.*—Continuous irrigation has been recommended by many, and is undoubtedly a means of effecting a constant removal of waste products. But it is at best in most cases a troublesome method to carry out; it is impracticable when dealing with large numbers of patients, and I do not think it yields better results than *good* mechanical drainage without its aid. For these reasons I have rarely employed it. Irrigation of the wound should, however, be performed when packs are being changed, as it not only helps to loosen the latter, but also removes any residual discharge and "floating" organisms. It is also useful for washing away discharge at intervals from areas which otherwise cannot be thoroughly drained (e.g., between bone fragments).

4. *Use of concentrated solutions of salts.*—Sufficient has been said before to indicate that I do not believe in the efficacy of this method. When drainage is carried out on proper mechanical lines it is quite unnecessary, and I cannot satisfy myself that it either increases the discharge or hastens cleansing of the wound. And here I must allude to an admirable paper by Captain J. E. H. Roberts and Captain R. S. S. Statham on "The Salt Pack Treatment of Infected Gunshot Wounds."[2] It is certainly the best paper I have read on the general treatment of wounds, and I can readily credit the excellence they claim for their results. But I think they have been unfortunate in the title of their paper and that they attribute their success rather to the wrong quarter. Their methods of drainage are very similar indeed to those which I have advocated here, and which I have employed now for two years, and I am convinced that their results will be equally good if they abandon the use of the salt in their packs.

[2] Brit. Med. Jour., August 26th, 1916.

5. *Administration of fluids to the patient.*—The discharge from a wound which is its natural irrigant is derived from the body fluids. When the discharge is profuse these fluids will rapidly become depleted and the discharge will diminish, and the elimination of waste products and toxins by the kidneys will be reduced unless we maintain the source of supply. Herein lies the value of the free administration of fluids in cases of severe sepsis.

The late Dr. J. B. Murphy, of Chicago, clearly recognised this in advocating proctoclysis in the treatment of general peritonitis, and he suggested that its mode of action in producing a natural irrigation of the peritoneal cavity was by transference of finid from the lumen of the bowel to the lymphatics, thereby causing a "reversal of the lymph flow in the peritoneum, so that the latter became a secreting and not an absorbing membrane." But it is surely more probable that the "reversal of the lymph flow" is merely the natural protective inflammatory exudate, which is *maintained and increased* by sustaining the body fluids to the full. In this way we see the application of the principle of fluid administration to all cases of infection as an aid to drainage. In severe cases with marked toxæmia, where shock or much loss of blood may be anticipated at operation or where very profuse discharge is to be expected afterwards, saline infusions should be given on the operating table and rectal salines should be administered subsequently; in less severe cases rectal salines alone will suffice. In all cases the patient should be allowed unlimited fluids by the mouth, provided the stomach will tolerate them. The free exhibition of fluids will largely prevent or remove the pinched, shrivelled look of severe sepsis; it will give the patient a general feeling of well-being, it will allay the appalling thirst, and it will maintain a free discharge from the wound until the infection is subdued.

Uses of Antiseptics in Wound Treatment.

Personally, I consider antiseptics valueless as a means of disinfecting a wound once infection has become established, but nevertheless they have their uses in wound treatment. They prevent stale discharges from becoming a breeding ground for bacteria, and so diminish the risk of infection spreading or being conveyed from one wound to another. Consequently they should be employed in the gauze dressings into which the wound drains, and should also be used in irrigating lotions. Soiled dressings should be placed in a receptacle containing some antiseptic solution when they cannot be burnt immediately. It matters little or nothing what antiseptic is employed, provided it is cheap and efficient and has no particular disadvantage; substances irritating to the skin, such as mercurial salts, should be avoided in the dressings. For irrigation I prefer a lotion containing peroxide of hydrogen, as it possesses special mechanical properties in loosening dressings and packs and in removing débris from the wound.

In the later stages of wound treatment antiseptics may be put to many uses to promote healing. But they are employed then, not for their antiseptic properties, but rather as caustics, astringents, or stimulants to control and direct the growth of granulation tissue in proper directions—a process which may be termed "coaxing the wound."

Vaccines.

Like most observers, I have not found vaccines helpful in dealing with infections in wounds of war. Perhaps the type of case in which resort to them is still most frequent is one of chronic sinus which has obstinately refused to heal. I believe that in every case of persistent sinus the obstacle to healing is *local* and *mechanical*—a sequestrum or focus of caries, a foreign body, drainage against gravity, too small a surface opening, callous rigid walls, or degenerated granulation tissue—and that the correct treatment is to deal with it accordingly. I know of one case in which a sinus persisted for nearly a year following a simple flesh wound in a limb. Eventually the surgeon was about to resort to vaccines, but a skiagram revealed the presence of a bullet in the muscles.

Rest.

The importance of maintaining the injured part at rest has been previously emphasised by other writers, and therefore needs only passing reference here.

Removal of Loose Bone Fragments.

Differences of opinion have been expressed as to the removal of loose fragments in the early stages from a septic comminuted fracture in view of the danger of non-union. I think the general tendency has been towards insufficient removal and that the danger of non-union is over-rated. In these cases we meet with three types of fragments which, according to their size, may conveniently be termed "fragments" proper, "gravel," and "sand." "Gravel" and "sand" should always be removed as thoroughly as possible; they merely form masses of necrotic débris in which discharge stagnates and organisms flourish. "Fragments" proper should be removed when they retain no connexion with periosteum and soft parts, as they are then avascular and completely necrotic. Fragments which retain their vascular attachments may be left *in situ, provided that their presence does not impede free mechanical drainage*, especially from the medullary cavity. Only one case of non-union has occurred in hundreds so treated.

Complications of Wound Healing.

I desire briefly to allude to two of the most important complications which one meets in dealing with wounds:—

1. *Deformities from muscular contractures.*—Muscles which are the seat of inflammation are liable to become permanently shortened, and so to lead to crippling deformities, especially in the limbs. Such deformities are usually easy to prevent but difficult to cure. Consequently we should *guard against them from the start*, and maintain the limb in suitable position. Contraction of the hamstrings with permanent flexion of the knee, and of the calf muscles with drop foot, are amongst the most important; corresponding conditions may occur in the upper limb. If injury to muscles is likely to impair or destroy the mobility of a neighbouring joint, the joint must be kept in the position in which it will be of the greatest use subsequently.

2. *Secondary hæmorrhage.*—This is almost invariably an indication that the drainage of a wound is faulty. Consequently it should not occur subsequently to operative treatment for infection, and it will practically disappear if we effect adequate mechanical drainage in the early stages. When it has occurred the case must be submitted to operation without delay, otherwise recurrence is a practical certainty. In every case where it is anatomically possible the wound should be explored and the source of bleeding found and dealt with *directly* by ligation of the vessel on both sides of the erosion, choosing a healthy part of the vessel wall. Faults in drainage should also be rectified at the same time. Packs and such measures should only be used as immediate temporary means of control; they lead to a false sense of security and are often ineffective in controlling the bleeding. Turpentine I regard as useless and even dangerous, as it may lead to increased sloughing in the tissues. Proximal ligation at some distance from the wound should never be adopted where direct treatment is possible; it may fail to control the bleeding primarily, and it is no safeguard against recurrence.

Subsequently to operation secondary hæmorrhage has, in my experience, been remarkably rare. It has only occurred in four cases—i.e., 0·25 per cent.—and I attribute this entirely to the methods of drainage employed. These cases are instructive as showing the cause of the hæmorrhage. In the first case, which occurred early in the series, the posterior tibial vessels yielded behind the lower end of the tibia, probably from the pressure of a drainage-tube. This is the only fatality I have had from hæmorrhage; the patient never rallied and died in less than two hours. In the second case, at operation for extraction of shell from a deep lacerated septic wound in the middle of the thigh received some ten days before admission and in which drainage was against gravity, the femoral artery was felt pulsating in the wall of the wound. The question of ligature was considered and rejected, but the vessel gave way 36 hours later. In the third case the brachial artery was perforated some three weeks after operation by a projecting spicule of bone on the upper fragment of the humerus, which was comminuted in its upper third. The fourth case was a difficult one of comminuted fracture of the lower third of the humerus with severe infection, in which anatomical considerations prevented adequate drainage in the direction of gravity. Here the ulnar artery yielded in the antecubital fossa.

I have operated on some 15 other cases for secondary hæmorrhage, and in each there were obvious mechanical faults in the drainage.

All cases (except that first quoted, where the patient was moribund when hæmorrhage was controlled) have been treated by direct ligation on the lines indicated. In none was there any recurrence of hæmorrhage and all patients made good recoveries.

The opinions expressed in this paper are the results of close personal observation and practice of war surgery extending now over a period of more than two years, and I believe that a more general recognition of the principles advocated, with their thorough application to all cases of infected wounds in their early stages, will help materially to improve our results and hasten the recovery of our patients. That good results can be obtained by these methods the following brief facts will, I think, bear witness:—

1. Out of all cases treated there has been only one death from sepsis. This was a very severe compound fracture of the upper end of the femur; the patient was already overcome with toxæmia when received, amputation was not practicable, and death occurred on the following day.

2. There was one death from gas gangrene, which developed rapidly in the upper half of the thigh. A high "guillotine" amputation was immediately performed, but it was impossible to get beyond the infected area.

3. Apart from three other cases of gas gangrene, in which amputation was successfully performed, only four amputations—all successful—have been done to save life. Three of these patients had been wounded some considerable time before coming under my care; the fourth had been literally riddled, and 22 shrapnel balls had been extracted (at three sittings) before it became necessary to amputate through a knee-joint eight days after he had been wounded.

It is questionable whether some of the limbs saved were worth preserving from a functional point of view, but this does not affect the results.

4. Two cases of tetanus occurred and both patients recovered under treatment.

Conclusions.

1. Efficient mechanical drainage is the essential factor in the successful treatment of infection.

2. The cardinal principles governing drainage are: Freedom of exit; gravity; capillary action.

3. Drainage-tubes should not be employed unnecessarily. They should effect the purposes for which they are used, and should not act injuriously in the wound.

4. Dressings should not be tight, of close texture, or waterproof. They should be exposed to the air while discharge is profuse.

5. Continuous irrigation aids disinfection by mechanical removal of discharge. It is usually not feasible when dealing with large numbers of cases. It is not necessary in order to obtain good results.

6. Free administration of fluids to the patient is an important adjunct in the treatment of sepsis.

7. The value of concentrated saline solutions and antiseptics as aids to disinfection is doubtful and negligible.

8. The use of salines and antiseptics in no way diminishes the necessity for free mechanical drainage.

9. Vaccines are not helpful in dealing with infections in wounds of war.

10. Rest is an important factor in wound treatment and should never be neglected.

11. Most of the complications and sequelæ of infection are due primarily to inefficient mechanical drainage, and are therefore preventable.

12. Delay in healing is almost invariably due to local mechanical causes.

My best thanks are due to Lieutenant-Colonel P. J. Freyer for the interest he has taken in my work and the kind remarks he has made on my paper.

Remarks by Lieutenant-Colonel P. J. FREYER.

Major William Pearson has invited me, as consulting surgeon to the Eastern Command, and therefore intimately associated with him in the work of the large war hospital to which he is surgically attached, to offer some observations on his paper on "Important Principles in the Drainage and Treatment of Wounds." Whilst readily complying with his request, my observations will be brief, for the simple reason that I entirely endorse the views enunciated by him, and

that anything I might say on the subject has already been simply, clearly, and forcibly expressed in this essay.

As my mission in this war has been mainly consultative, and only to a minor degree operative, I have had ample opportunities in passing under review tens of thousands of wounds of all types and degrees and of comparing the methods and results of other surgeons, many of them amongst the ablest in the profession, and all actuated by the desire to place at the disposal of their patients what they considered the best methods of treatment. The "supersaline" treatment with its paraphernalia was much in vogue in the early days of the war, but has been gradually disappearing from the stage. Antiseptics innumerable have, of course, been employed, and successfully employed, I have noticed, in proportion to the adequacy of the accompanying drainage. At my first visit to Major Pearson's wards, containing some 500 beds, I was much struck by the simplicity of the dressings and the thorough mechanical drainage of the wounds. Each subsequent visit confirmed me in my admiration of the surgical methods employed and the results obtained therefrom. I can honestly say that I have never seen better surgical work than that accomplished by the simple methods described in this paper.

THE

INFLUENZA EPIDEMIC OF SPRING, 1915; WITH SPECIAL REFERENCE TO ANOMALOUS THROAT SIGNS.

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Introductory.

THIS paper is a résumé of observations on some 500 cases of influenza in civil practice in South London, occurring about two years ago; time having hitherto been otherwise occupied, these observations could not be sent to the press until now. At the end of 1916 we were faced with the same perennial visitor, and to demonstrate its vagaries this paper should make possible a comparison between the syndrome of spring, 1915, and that of the last months of 1916.

It must primarily be remembered that the influenza germ is certainly responsible for a variety of lesions, dissimilar in almost every epidemic and in almost every locality, yet retaining certain common traits. For instance, the older physician scarcely recognises the modern type of influenza as his old friend the "knock-me-down fever," and therefore is apt to overlook it, if not to despise it as unworthy of much attention. Yet I venture to state, and herein hope to show, that the clinical and bacteriological phenomena associated with this complaint are a study worthy of much attention and as yet largely unfathomed, in spite of the enormous literature on the subject.

At the onset I wish to state that although the cases of the present epidemic appear to be rather more severe, they present many of the phenomena which I am about to describe.

General Description.

Adopting the older classification of catarrhal, nervous, and abdominal types, one could describe the cases of the 1915 epidemic as partaking of a combined catarrhal and nervous type. The abdominal type was almost completely absent. All these cases presented in the first stages a vesicular eruption on the soft palate, fauces, and posterior pharyngeal wall, with erythema of the mucous membrane, and were generally followed by neuralgias or other nervous phenomena. The initial symptoms were mild, but complications were frequent and varied. The catarrh was protracted and the nervous system slow in resuming its normal tone.

To sum up, one might describe the syndrome as a febrile catarrh with a secondary neurotoxic lesion as its most prominent complication. Later statistics will be given and these lesions classified. Before going further it will be well to have a clear clinical picture.

A typical case was that of a man, aged 25, a smoker. The patient was in contact with several folk afflicted in this epidemic. At first he had a feeling of malaise, with muscular pains in the limbs, especially the thighs, also frontal headache and disinclination for work. That evening his temperature was 101° F. and pulse 72. The urine was febrile. He had, the day before, noted an abundant pharyngeal catarrh, so abundant that he was continually expectorating mucus. He complained of a sore throat and had some conjunctival injection.

Examination of the throat showed an erythematous patch of a dark red colour on the right side of the soft palate and uvula, which was in this case unilateral, ceasing abruptly at the middle line. Upon this erythematous patch were seen about half a dozen almost transparent vesicles, about the size of a pin's head, whose base was faintly reddened. More could be seen on that part of the soft palate where there was no erythema. The vesicles were quite firm to touch. There were vesicles also on the posterior pharyngeal wall and also some granulations. There were no adenoids or tonsils to speak of.

There was no anterior nasal coryza. The soft palate was definitely tender to touch, and neuralgia was complained of in the teeth on the right side.

The temperature was down next morning, but there were still headache and "shivering feelings" in the back. In a day or two, the mucous discharge had ceased, but the throat was extremely sore for a week or more and the remissions lasted for a month. The general symptoms subsisted in three days, but the vesicles recurred for three weeks or more—i.e., as long as the throat was sore. Even exposure to a cold wind would cause their reappearance after apparent subsidence. Beyond a general nervous debility the case was free from complications. After four to six weeks the hypotonia gradually wore off, with complete recovery.

Bacteriological examinations were kindly made for me by Dr. W. E. Kingdon, of Sheffield University. Cultures from the vesicles were made on hæmoglobin media and stained for influenza. Only staphylococci and streptococci were found. True influenza bacilli were obtained by myself earlier from the mucous discharge on the posterior pharyngeal wall, but could only be obtained quite early in the disease.

The above somewhat, but I hope not unduly, detailed description represents a fairly typical case. Whilst the age and sex incidence was not in any way restricted, as a general rule youth and middle-age suffered most.

Analysis of Syndrome.

Analysis of the syndrome (group of symptoms) falls under four headings, and will be illustrated:—(1) The severity of the initial coryza; (2) the erythema and persistent vesicles in the throat; (3) the sequential neuralgias; (4) the variety of complications.

1. *The severity of the initial coryza.*—In the above quoted case the flow of thin mucus was so severe that it was impossible for the patient to smoke at all, and he was compelled to expectorate large quantities of mucus and saliva. At night he was kept awake by a troublesome hawking. It may be important to note that almost always the cough was relieved by small doses of morphia, this suggesting a nervous origin, in part.

In another case, a male aged 72, who had had cerebral hæmorrhage about five years before, was so troubled with coryza that the strain of expectoration brought on epistaxis, which could only be controlled by firm nasal tamponage.

An infant, aged 10 months, was continually salivating and coughing for three days, with much vomiting, showing the excess of mucus had been swallowed.

In another patient continual hawking and expectoration brought on a subconjunctival ecchymosis.

In a pregnant woman, aged 38, the expectoration caused an abdominal muscular rupture.

Such examples are sufficient to demonstrate this very unpleasant symptom.

2. *The erythema and vesicular eruption.*—This complex is largely the *raison d'être* of this paper. *In no case examined with a typical influenza syndrome did I fail to find this clinical picture.* Also it should be noted that in only one case was there an eruption (and that herpetiform, and on a mucous surface, the lips) found elsewhere on the body.

Numbers of patients came up complaining of sore-throat, which they found difficult to get rid of, of 10 days' duration or more, and no other symptoms save slight malaise. Examination of the soft palate, uvula, and posterior pharyngeal wall invariably showed some vesicles about the size of a pin's head, and nearly always accompanied by erythema.

Others came up complaining of facial or orbital neuralgia but no sore-throat. Examination of such cases revealed the same clinical picture; in fact, this throat *syndrome one found pathognomonic in this particular epidemic of influenza.*

One rather puzzling case of what was apparently influenzal neuralgia, where one expected to find vesicles and erythema,

showed none. After the customary irrelevant excursions it appeared that the patient, aged 22, a woman, had suffered from neuralgia for several years. It was a typical case of neuralgia quinti major, for which she had had many dental operations. Here the exception proved the rule.

Discussion as to the etiology of this condition—namely, the erythema and vesicles—will be given later.

3. *The sequential neuralgias.*—Although almost invariably the neurotoxic effects were sensory, one of seventh nerve palsy was observed. This occurred in a man aged 45. There was no history of otitis media, but insanity had occurred in his brother. The lesion was unilateral and had all the characteristics of the lower motor neurone type. The patient slowly recovered, almost completely. He had a typical vesicular throat, which persisted some three to four weeks. The general disturbance was nil.

In the main, however, the neurotoxic effects fall most heavily upon the sensory nerves, and may be classified thus: A. Pain in the palate and fauces ("sore-throat") due to affection of the palatine and naso-palatine nerves, i.e., fifth root. B. Pharyngeal (pain on swallowing), i.e., ninth root. C. Facial neuralgia, i.e., fifth root. D. Orbital neuralgia, i.e., fifth root. E. Frontal neuralgia, i.e., fifth root. F. Aural neuralgia, with or without vertigo, due to affection of the fifth, seventh, or eighth nerves (the seventh only if exposed).

Severe otalgia, certainly not due to an exposed seventh nerve, except in one case, was quite frequent. It required morphia at times, but rarely preceded a true otitis media of the suppurative variety. Usually it subsided, showing only intense injection of the tympanic membrane. Trifacial neuralgia of a mild type was common, also orbital and frontal neuralgias, both with and without conjunctivitis.

4. *The variety of complications.*—An almost universal feature was nervous debility with a disinclination for food—and for work. Acute prostration was the exception, but one case was thought to be typhoid fever for a short time. Otitis media has been mentioned. Two cases of appendicitis were noted. Herpes of the lips, apart from pneumonia, occurred twice, and there were several cases of persistent sweating on slight exertion. Nervous debility on two occasions merged into melancholia of a mild type. A case of epistaxis in an old man has been mentioned.

It will be convenient at this point to give the actual statistics:—

Cases of undoubted influenza	514
Cases whose throats were examined	456
Percentage of these with typical throat signs	100%
Mortality	0·3%
Percentage of all cases with complications	42·0%

Persistent Neuralgias (i.e., over 48 hours duration).

Frontal	27·3
Facial	18·2
Orbital...	15·7
Aural	13·8

Other Neurotoxic Complications.

Vertigo...	6·9
Seventh nerve paralysis...	0·2
Herpes of lips	0·2
Persistent sweating... ...	3·0
Melancholia	0·4
Conjunctivitis	4·0
Unclassified complications	10·3
	100·0

Hypotheses as to Mode of Origin of Erythema and Vesicles, with Review of Supposed Mode of Infection.

1. That the vesicles are the accumulated secretion of inflamed mucous glands. A study of the anatomy of the soft palate and surrounding structures reveals large numbers of mucous glands. Whereas these glands no doubt share the toxic effect, the vesicles are quite firm to the touch and resistant, unlike a mere retention-cyst of mucus. Finally the glands are innumerable, but the vesicles few.

2. That the vesicles are part of the clinical picture of aphthous stomatitis. Aphthous stomatitis according to Taylor, is not common in adults. It consists of circular grey patches appearing on the gums about the first dentition, on the tongue, and inside the lips and cheeks. They have the appearance of vesicles which subsequently ulcerate. They are said to consist of a fibrinous exudate beneath the epithelium. They heal in a few days, but may recur. In adults they are far less numerous than in sickly children in whom they are most common. Such a description tallies well with our clinical picture, but for two discrepancies. The erythematous vesicles never appear on the tongue, lips, or cheeks. Moreover, they never ulcerate.

3. That the lesions are caused by an epizootic ("pink eye") transferred to man from certain lower animals. This hypothesis should not be confused with the one which claims that influenza in horses (or other animals) is identical with human influenza. Inoculation experiments have disproved this, for human influenza is not inoculable on animals, or at any rate the human syndrome, as the older practitioner knows it, is not reproduced. In monkeys some degree of toxicity obtains, but horses are immune. Many writers interpret this as meaning that equine influenza is not communicable to man. Personally I do not see the force of this argument. Until man has been inoculated with equine influenza, who is at liberty to assert that such inoculation will prove abortive? Yet such is the orthodox opinion of to-day. There seems to me no inherent reason why man should not be susceptible to both the equine and human varieties. The history of influenza points to this. Horse-breeders are convinced of its probability. It will, therefore, not be out of place to review two pieces of evidence.

According to Hopkirk, who has studied the history of influenza very carefully, the earliest instance of supposed influenza occurred during the tenth year of the siege of Troy, affecting the Grecian camp. It was very fatal, if it was influenza.

In 1404, Baliolanus reports an epizootic of low mortality amongst men.

In 1410–11, in the Paris epidemic, there was an epizootic amongst birds.

In 1562 there was a characteristic outbreak in the British Isles, then called "The acquaytance." "It is a payne in their heades that have it, and a soreness in their stomaches, with a great cough. It remayneth with some longer, with others shorter tyme, as yt findeth apt bodies. The Queene kept her bedde six dayes. There was no appearance of danger, not manye die except some old folks," so writes Queen Elizabeth's ambassador at the Court of Mary, Queen of Scots.

In 1889–90, in the respiratory type, we note "redness and swelling of pharyngeal mucous membrane, with increased secretion, often followed by laryngitis and conjunctivitis with photophobia. Neuralgia of the fifth nerve was common.

Along with these manifestations which closely resemble, in one respect or another, our syndrome, it was noted that cows and horses suffered in 1733, 1737, 1803, 1831, 1837, and 1915. Also dogs, cats, deer, sheep, swine, poultry, and fish had contemporaneous epizootics on these occasions. It is improbable that on all these occasions when influenza was raging (and can anyone recollect a year when it was not?) that these epizootics were anything to do with the human disease, but they may have been in some instances, and their occurrence is noteworthy.

As regards 1915, concerning the connexion between "pink-eye," mentioned by Goodhart in Allbutt and Rolleston's "System," Mr. C. Sorby Straw, of Streatham, who has owned and bred horses for many years, states that "he believes that 'pink-eye' is really influenza, the 'membranes' become very red. It starts with a chill, they run at the nose, have sore throats, and sometimes end by being broken-winded. Isolation is rigorously carried out." Mr. Straw's son in the Territorial Yeomanry fully believes he contracted laryngitis from "pink-eye" in his horse. Pink-eye was very rife in many camps, so was influenza.

Is there anything in medicine resembling this? Assuredly, we know bovine tuberculosis, or, better, glanders and anthrax. These are epizootics having a slightly different syndrome in man compared with their zoological appearances. It therefore behoves us not lightly to dismiss an influenza case of an atypical nature as impossibly of equine origin, although we cannot *prove* equine origin until some man has been inoculated with "pink-eye."

4. That the lesions are identical with herpes zoster. Herpes zoster is defined by Henry Head as "vesicles on an erythematous base." It will be worth our while to study this affection.

It must not be confused with herpes febrilis. The former rarely recurs, the latter habitually. Zoster is rarely bilateral, febrilis is generally found thus. A definite nerve area is affected in the former, not so in the latter. Central degenerative changes are to be found in herpes zoster, not so in herpes febrilis. The two may coincide. The optimum age-incidence for zoster is 4–13. It tends to occur in epidemics, but they are not easy to trace.

Acute specific zoster is analogous to anterior polio-myelitis. Inflammation or hæmorrhage of the posterior root ganglion is found. These cells, it is interesting to note, are the morphological equivalents of the anterior horn cells.

In 1896, 1897, and 1898 epidemics occurred in March, May, June, and July, and up to October. Atmospheric conditions and intercurrent disease—e.g., measles, diarrhœa, pulmonary tubercle, arsenical poisoning, dementia paralytica, and other mental diseases—were said to have been etiological factors. Acute lobar pneumonia as a cause is well known.

Symptomatic zoster occurs in tabes dorsalis, myelitis, caries and necrosis of ribs, sarcomata, especially those invading ganglia, caries of the spine, and cerebro-spinal

meningitis. It is purely secondary and symptomatic and not of interest in this connexion.

The pathology of these lesions is, however, significant. Marchi's method shows the slow, degenerative changes excellently. The lesions in the central nervous system are hæmorrhage into the ganglia in acute cases, with secondary degenerative changes in the posterior roots and their peripheral nerves.

The symptoms are; malaise, a temperature not greater than 100° F., and shooting pains in the affected regions; so severe are they in herpes intercostalis that this has been diagnosed pleurisy or pneumonia. The pyrexia lasts two or three days and the rash only appears on the third or fourth day. Small gangrenous patches on the skin may occur. Hyperæsthesia and deficient thermotactic sensation are known as common sequelæ.

Herpes febrilis is but a special name for pneumonic herpes. Herpes of the soft palate is often bilateral. It is not difficult to see many essential differences between these signs and symptoms and those of the syndrome under consideration.

Of the pathology we can compare little. In true human influenza hæmorrhagic lesions are well known. Our lesions, possibly similar, were too transient to be so severe as to be mistaken for either typical nervous, old-fashioned "flu," or for typical zoster. Intercurrent disease hardly played any part. The pain at no time was severe and the rash appeared at the outset. Ulceration was never seen, nor was there anæsthesia.

Therefore we may confidently assert that our syndrome was distinct from that of herpes zoster.

Boylan, Heller, Hutchinson, and Hall have reported on pharyngeal herpes, a rare complaint, but none of them give any instances of "contagium vivum" as a cause. Other writers—e.g., H. F. Parsons and Sadler—have referred to cases of epidemic herpes, which were always cutaneous, and therefore irrelevant in this case. Frederick Taylor refers to certain "aberrant vesicles" in herpes. He does not, however, give their site of election, nor discuss their etiology.

Semon, in Allbutt's "System" describes two varieties of "angina herpetica," or herpes pharyngis. The first is comparable to herpes febrilis, the second to herpes zoster. The first has a grave prognosis, the second is painless, afebrile, and recurrent. Wherefore both are irrelevant to us.

5. This leads to consideration of the final suggestion—to wit, that the eruption, although clinically similar to herpes zoster, is, in reality, due to an influenzal intoxication of centripetal diffusion (cf. tetanus). There was no question but that these were cases of influenza. Their symptoms can be traced all through history, with one exception, yet the throat lesion was invariably present. The *modus operandi*, however, is not clear. Granting that the lesions were herpetic, let us revert to the anatomy of the sensory nerves. Anatomy shows that the spheno-palatine ganglion and its branches connect up with otic, Gasserian, geniculate, and sympathetic ganglia. This implies a possible path for intoxication of their neurones. Neuralgia of the face, teeth, orbit, frontal regions, and throat are conceivably to be explained as toxic neuroses of these ganglia and neurones. Infection is, in the last analysis, intoxication. The process may have started in the palatine branches, and thence spread centripetally, after the fashion of the tetanus toxin. But for all that there were no influenza bacilli to be grown from the vesicles. Even so, they were present in the contiguous sputum, and secondary influenzal lesions generally only contain staphylococci and streptococci. *Faute de mieux*, this hypothesis is the one to which I pin my faith. Nevertheless, I realise that the pathological basis upon which it rests requires further consideration. I am prepared to go further and admit that the hypothesis is largely the product of induction, nevertheless I believe that the train of reason which led to it will bear the test of logic. The inductive method is copied from good sources. It led Charles Darwin to the theory of evolution.

Conclusions.

The influenza toxin spreads centripetally along the sensory nerve tracts, expending itself on the first footholds—i.e., pharyngeal mucosa and its substructures—and thence passes to the palatine nerves. The effect of the virus is inflammatory; on a mucous surface it causes a vesicular eruption ("vesicular neuritis"), whilst deeper down it causes similar inflammatory changes, giving rise to pain.

The virus spreads far into the central nervous system, even poisoning the vagal or sympathetic nerves Tachycardia and bradycardia are well-known sequelæ. The cerebrum shows the aftermath of influenza in a varied and sometimes to a sinister degree. The epidemic of spring, 1915, in London conceivably had an equine origin, not conversely, for human influenza cannot affect horses. That the syndrome occurred elsewhere is not unlikely. Military cases seen as late as February, 1917, without exception show "vesicular neuritis."

The theory of centripetal diffusion of the toxin via the neurones seems borne out by the rarity of influenzal septicæmia as compared with the frequency of neuralgia, &c., in influenza. It is very rare to find Pfeiffer's bacillus late in the disease and rarer still to find it in late complications. It is not even agreed that Pfeiffer's bacillus is the cause of influenza, but, assuming that it is, the diffusion of the toxin which has a partiality for the neurones mentioned is, to my mind, better explained by the theory of centripetal nerve diffusion (cf. tetanus) than it is by the theory of hæmic diffusion.

No one is better aware than I am, however, that the pathological depths of this subject require far greater exploration before the theories herein propounded may become facts. Any information on the subject will therefore be very welcome.

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THE NERVOUS FACTOR IN RELATION TO OPHTHALMIC CONDITIONS.

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THE war is the greatest nervous strain the world has ever known and has brought the nervous element in disease into prominence again. It is impossible to remain long in a large military hospital at the present time without seeing the essential similarity between the effects of fatigue, shock, and traumatism, and the results of intoxications, glandular deficiencies, dietetic errors, and psychic influences. The fact that a patient is cured by the exhibition of thyroid extract, or by a colectomy, or by judicious dieting, does not prove that the cause of his condition was either his thyroid, his colon, or his cook. What one wants to know is why his glandular secretion is no longer adequate, why his intestinal contents have become poisonous to him, and why he cannot eat the good square meals he used to enjoy.

Sir James Goodhart said many years ago that there are only two kinds of indigestion: that due to over-eating and over-drinking and that due to deficient nervous energy. The alimentary canal of a patient whose nervous energy is inadequate may show abnormalities of peristalsis, absorption, and secretion, all or any of which may be increased or diminished. Whether the actual discharge of secretion is due to a nervous or to a chemical stimulus, the trophic condition of the gland, and therefore the production of the secretion is under the control of the nervous system. There are, then, two ways of treating indigestion due to defective nervous energy, the one to order an easily digestible diet, the other to increase the available nervous energy. So also with the ductless glands, we may either exhibit what we think to be defective, or we may try to set more energy free with a view to restoring the natural harmony. Similar arguments apply to almost any part of the body, hence the therapeutic value of rest.

The total amount of nervous energy varies greatly in different persons, and this total amount may be so far reduced as to make the ordinary duties of life inadvisable or impossible by four different causes: (1) any exhausting stimulus or succession of stimuli; (2) poisons or toxins; (3) inadequate nourishment or loss of blood; (4) psychic influences. The existence of one cause favours the action of another. A man who is

suffering from a serious head injury is, *ceteris paribus*, more likely than another who is not to be infected by toxins, he will not stand a serious hæmorrhage so well, and his recovery will be retarded by any great grief or anxiety. Similarly, an alcoholic is more liable than a temperate man to fall a victim to his own pneumococci after a chill, and not the least important factors in his treatment are rest, suitable nourishment, and freedom from worry. Such a condition of lowered nervous energy is in reality always a general one, but is apt to show itself more particularly in certain organs, either because they are points of least resistance or because the toxins at work have a special affinity for them. The presence of pyrexia also depends largely upon the predominance and nature of the toxic element. The existence of a gross organic lesion, such as mitral stenosis, is in itself a great tax upon the available nervous energy, and if it leads ultimately to death it does so because from some such causes as those mentioned above the nervous energy is no longer adequate to meet both this and the ordinary calls of the body.

In the present state of our knowledge the eyes are almost the only part of the nervous system which admit of constant direct mechanical assistance. Very few eyes are of perfect shape, and practically no pair of eyes. The imperfections are as far as possible corrected by neuro-muscular action, and, as it is only rarely that both eyes are symmetrical, the effort needed is usually different for each eye. Not infrequently also the balance of the external ocular muscles is not exact, so that further effort may be necessary to keep the visual axes parallel. All this muscular effort is constantly maintained except during sleep, and uses up a certain proportion of the total nervous energy, small indeed and probably inappreciable in health and youth, but far greater and more important in ill-health and as years advance. Indeed, in acute illness, when the patient is confined to bed, the ocular muscles are almost the only muscles not essential to life which are in comparatively constant use. That a patient should have trouble with his eyes during or after such an illness usually occasions but little surprise either to himself or to his physician, and they both expect them to improve with the general health. Much can be learnt as to the nature of morbid conditions by applying the converse of this and seeing what effect is produced upon these conditions by removing the ocular element as far as it is possible to do so, and so relieving the nervous energy of a certain amount of the work imposed upon it. The methods available for this purpose are: (1) covering or shading one or both eyes; (2) the use of cycloplegics; (3) the accurate correction of refractive errors; (4) the employment of prisms; (5) the use of tinted or Crookes's lenses.

In acute illness the patient is apt to protect himself by keeping his eyes shut and avoiding bright lights. When he is definitely complaining of one eye more than the other his general condition will almost always improve to a striking extent if the eye complained of is covered by a light comfortable shade. This should always be borne in mind in obscure conditions, such as intractable vomiting. Still further help may often be given by atropising both eyes, after excluding all possibility of glaucoma, and shading the one complained of. When covering one eye has given great relief, trouble may be expected when the shade is abandoned, and the patient should never be got up till he can use both eyes together again. Tinted glasses might be used with advantage in acute conditions more than they are, and when a patient has received benefit in comparative health from glasses correcting his refractive errors it is illogical for him to give them up entirely in severe illness. Shading or even bandaging both eyes may be of great value when an invalid has to be taken on a journey. In an acute illness, whatever its nature, the eyes should always be definitely inquired about with a view to relieving general symptoms. It is obvious that the methods referred to act, partly by diminishing peripheral stimuli and partly by lessening the calls on the nervous energy.

But it is from subacute and chronic conditions, in which time is not of so much importance and there is not so much confusion between *post* and *propter*, that one can learn most. Dark glasses may be of use in many such cases, but if they are used the tints should be reduced at rapid intervals or the patient may find it very hard to give them up. Covering one eye will be almost certain to improve the general condition if the eye is painful or cataractous, or if there is any considerable anisometropia or heterophoria. Here, again, it is necessary to use common-sense and not to allow the patient to do all sorts of things because after a few days he feels much better, and so throw another form of strain upon the nervous system and only rob Peter to pay Paul.

The accurate correction of refractive errors is a most important method of studying nervous energy. The patient should be chosen because his symptoms are intractable and uncanny, because he does not convalesce in the orthodox way, because he gives a history of rheumatism, "influenza," appendicitis, &c., rather than because he is complaining of his eyes. Every system should be inquired into, and it is advisable, and makes a useful exercise, to elicit the information required without making any reference to the eyes. One soon becomes accustomed to the different manifestations of lessened nervous energy in the different systems, and it is usually easy to distinguish the malingerer from the genuine sufferer. One is playing with edged tools all the time, and has no right to order glasses as medical treatment unless the patient can be kept under observation until the accuracy of the correction has been proved. It may be possible to prescribe accurately at the first attempt, but I can only say that, after between four and five years' work at the subject from this point of view, I become more and more convinced day by day of the difficulties that have to be faced. One is trying to fit the rigid to the less rigid, and it is no easy task. The only test of accuracy is a decided improvement in the patient's general condition, obvious to himself and to others. The relief of headache is no test, and headache at least has the advantage of calling attention to the eyes, while other symptoms that may be substituted for it are far more subtle and therefore more dangerous. The more the nervous energy has been lowered the more obvious will be the patient's improvement, and the more quickly it will pass off if the correction is only partial.

A large stock of lenses should be kept, and the correction changed every few days until the greatest possible accuracy has been obtained, so that a minimum and as far as possible equal, amount of work is left for each eye to do without changing its nature. The sphere is usually a greater difficulty than the cylinder, and the slightest over-correction of either element leads to the patient having ultimately to deal with a new unnatural error. When the real correction is R. + 0·375 C., L. + 0·125 S., + 0·25 C. and + 0·25 C. is ordered for each eye, there will almost certainly be great temporary improvement, but the remainders—viz., R. + 0·125 C., L. + 0·125 S., may ultimately prove at least as much trouble to the patient as the original condition. The smaller the error the easier it is to obtain accuracy; small degrees of myopic astigmatism are by far the easiest to deal with, and give most satisfactory results. A cycloplegic is almost always necessary, and if atropine is used the patient's comfort is often greatly increased by keeping one eye covered by a shade or opaque disc. If it is necessary for him to continue at work he can have the atropine in one eye at a time and keep the atropised eye covered. In difficult mixed or compound cases it may be advisable to get the worse eye right before starting on the other. Though good results are not probable unless the patient can be made to read at least 6/6, one should not be content with any artificial standard, but rather with the maximum acuity it is possible to get out of each eye.

Anyone who will try conscientiously to correct refractive errors on some such lines as these will find that he can do a great deal of good, and that he has opened up a fascinating method of studying the nature of morbid conditions.

IN view of the value of the rabbit as food, the Vice-Chancellor of the University of London has given instructions that it shall not be used in practical examinations in zoology for science students or in general biology for medical students during the period of the war.

THE CHARD TOWN COUNCIL, THE WATER-SUPPLY, AND COMPENSATION FOR ENTERIC FEVER.—At the last meeting of the Chard town council the subject of the compensation for persons who had contracted enteric fever and who had claimed out-of-pocket expenses from the council came under discussion. The matter has been previously mentioned in THE LANCET. The finance committee, to whom the whole question had been referred, reported that they could not recommend the council to accept any responsibility or admit any claim.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CALCIFIED FIBROID CAUSING COMPLETE AXIAL ROTATION OF THE UTERUS.

BY C. HUBERT ROBERTS, M.D. LOND., F.R.C.S. ENG.

THE patient was admitted to the Samaritan Hospital for Women. She was aged 55, married, no pregnancies. The periods had ceased for ten years, previous to which they had been very profuse.

The patient stated that she knew she had a tumour in the abdomen "for many years," but that it had given her very little trouble. About three months before admission she began to suffer with acute attacks of abdominal pain, which of late had been very severe and accompanied with cramps and sickness. Her general condition was good. On examination a large hard swelling could be easily felt in the abdomen, reaching to the level of the umbilicus, more marked on the left side than the right. It was very mobile and could be freely pushed about the abdomen. On vaginal examination there was a small atrophic cervix; movements of the abdominal mass communicated themselves to the cervix. The fundus could not be determined. The diagnosis was made of a calcified fibroid, ovarian dermoid, or ovarian fibroma. There was no free fluid.

On Nov. 16th last the tumour was removed by abdominal section. It was easily lifted out of the abdominal cavity, and was found to be densely hard and very heavy. The remarkable feature of the tumour was its pedicle, 8½ inches long, the thickness of two fingers, and consisted of an enormously elongated senile uterus, which at the level of the supravaginal cervix had undergone an acute axial twist, 2½ times, the twist being from left to right forwards. The appendages were included firmly in the twist. The torsion was easily undone, and the tumour simply amputated from the fundus uteri, to which it was attached by a pedicle 1½ inches wide. The vessels below the twist were deeply engorged, but there were no adhesions anywhere and no free fluid. The senile uterus and appendages were left *in situ*. The patient recovered completely, the temperature being normal throughout her stay in hospital.

The tumour was a well-marked example of complete calcareous degeneration of a fibroid. When fresh it weighed 4½ lb. It was so hard that it took a considerable time to cut through, and spoiled two saws in the process.

The importance of the specimen is that it caused axial rotation of the *uterus*. Axial rotation of the pedicle of a stalked fibroid is not uncommon, and may lead to acute degeneration of the tumour, but complete torsion of the uterus itself is very rare. I have not met with a case in my own practice before. Most of the cases reported of axial rotation of the uterus by a fibroid have been only partial—i.e., say half a twist—possibly leading to acute abdominal pain, accumulation of blood or pus in the uterus, or necrosis of the tumour.

In this case the twist was 2½ times, but as the uterus was senile and the pedicle very thin from long traction this amount of twisting was easily possible, in the same way as it sometimes occurs in pedunculated ovarian cysts.

Welbeck-street, W.

"THYROID STONE."

BY VERNON PENNELL, M.A., M.B., B.C. CANTAB.,
FELLOW OF PEMBROKE COLLEGE, CAMBRIDGE.

THE following case may be of interest, owing to its comparative rarity.

The patient, a man aged 45, sought advice for aphonia which had lasted for three months, and which he thought might have been due to excessive smoking. On laryngoscopic examination, however, it was seen that the left vocal cord was completely paralysed and immobile. The heart, lungs, and central nervous system showed no lesion, nor was there any cervical gland enlargement. There was a small, hard lump on the left side of the neck, situated in the position occupied by the left lobe of the thyroid. It moved upwards and downwards on swallowing and did not appear to be very fixed in its attachments, except when attempting lateral movements. In size it was about that of a small walnut, and was slightly tender on deep palpation. A diagnosis of early carcinoma of the thyroid with infiltration of the left recurrent laryngeal nerve was made, and operation recommended. The thyroid was exposed by a transverse incision at the root of the neck and the left lobe identified. On delivering the upper pole forwards, a craggy mass of rock-like consistency was found, rather larger than had been expected from external palpation, in the position normally occupied by the superior parathyroid. It was tightly wedged between the thyroid gland and the œsophagus and vertebral column, and pressed on the recurrent nerve of that side. As part of the left lobe presented several small cysts, it was deemed advisable to perform hemithyroidectomy. The wound healed by first intention and the patient made an uninterrupted recovery, regaining full vocal power after three days.

The growth proved to be a completely calcified adenoma with only the thinnest of capsules stretched over it. It was quite easily detached from the remains of thyroid tissue of that side. As no sign of a superior parathyroid was found after careful examination it is conceivable that this mass was parathyroid rather than thyroid in origin. The diagnosis would almost certainly have been greatly assisted by a skiagram, but this was unfortunately omitted and an unnecessarily gloomy prognosis given.

Pembroke College, Cambridge.

AN OBSCURE CASE OF PSOAS ABSCESS.

BY EVELYN A. CONSTABLE, M.B., B.S. DURH.,
SURGICAL REGISTRAR, LONDON TEMPERANCE HOSPITAL.

THE case on admission presented difficulties of diagnosis, and is for that reason worth recording.

The patient, a female, aged 41 years, married, was sent in, on Dec. 16th, 1916, by Mr. F. Greaves, to the London Temperance Hospital, under the care of Mr. J. McClure, complaining of pain in the right loin and vomiting. Three weeks before admission there was gradual onset of "aching pain" in the right side of the abdomen, accompanied by vomiting, which had occurred twice or thrice daily for the last two weeks. Bowels opened daily (only took aperient once). Menstruation was usually very regular; the last period was two weeks over time, so patient ascribed her symptoms as probably due to pregnancy. She had never had a similar attack before. There was nothing in the past history bearing on the case. Condition on admission: Tongue dry, red, and ridged. Some gingivitis and dental caries. Appetite usually very good. Urine neutral, specific gravity 1018; no albumin or sugar. Spine: no tenderness on percussion or other abnormality detected after careful examination. Locally a hard, oval-shaped mass of the size of a small cocoanut extended from just below and to the right of the umbilicus to the right costal margin; it was slightly movable at the inner pole but appeared fixed at the upper and outer one. It did not move on respiration. Per vaginam the cervix was soft and lacerated, "erosion" present; uterus freely movable. Blood count (by the pathologist, Dr. H. H. Sanguinetti): Hb 65 per cent.; erythrocytes 5,560,000, leucocytes 25,500 per c.mm. Differential count, per cent.: Polymorphonuclears, 89; lymphocytes, 10; transitional, 1. Diagnosis: ? Malignant disease of ascending colon; ? kidney tumour; ? appendix abscess.

Laparotomy by Mr. McClure on Dec. 31st. A vertical incision, 5 inches long, was made over the tumour in right hypochondrium. The "tumour" turned out to be a normal right kidney, pushed forward by a large psoas abscess. The latter was incised below and posterior to the lower pole of the kidney, and about 1½ pints of green homogeneous pus were evacuated, evidently coming from the spine. The cavity was irrigated with a flushing curette. The posterior peritoneal layer was then approximated by interrupted sutures and the anterior abdominal wall closed in layers. No drainage. The vermiform appendix and gall-bladder were examined and appeared normal. The skin and subcutaneous tissues, unfortunately, broke down, but afterwards did well on Dakin's hypochlorite dressings, and patient left hospital on Jan. 29th, 1917, with only a very small superficial wound.

X ray skiagram, taken by Dr. J. H. Rhodes after the operation, showed some erosion of the right side of the body of the second lumbar vertebra.

A somewhat similar case, I am informed, occurred in this hospital about 16 years ago. I am indebted to Mr. McClure for permission to publish the above notes.

West Green, N.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ELECTRO-THERAPEUTICS.

The Origin of Electric Currents led off from the Human Body.

AN ordinary meeting of this section was held on March 16th, Dr. G. HARRISON ORTON, the President, being in the chair.

Professor W. M. BAYLISS read a paper entitled "The Origin of the Electric Currents led off from the Human Body." It was concerned with an examination of the book on the subject of "Electric Pathology" written by Mr. Baines. The whole of this theory, and the practice founded upon it, depended on what Mr. Baines termed "nerve leaks," these leaks being detected by the use of silver electrodes and a high-resistance, very sensitive galvanometer. The human body was a very heterogeneous system, the solids of which in a dry state were non-conductors of electricity, but when soaked with salt solutions became conductors. So that the human body, as a whole, was a conductor, of a kind, but not at all comparable to that of a telegraph cable. It was not merely the salts in the solutions which conducted the electricity; it was the ions of the salts, from which they were dissociated when dissolved in water. The dissolving in water split the salt up into two separate parts, each of which had an opposite electrical charge, though when united together they were neutral. Though that seemed obvious, it was not the view taken by Mr. Baines in his book, for he said: "It is now held that this view is incorrect, and that when a salt is dissolved in water its constituent molecules undergo, to a greater or less extent, atomic as well as molecular dissociation, so that a portion of the electrons become free and are diffused throughout the water as ions." Mr. Baines spoke as though electrons and ions were identical. It was one of the chief errors underlying the thesis. This was confirmed in the glossary, for ions were defined as "free electrons in gases, fluids or solids." There was no proof that atomic disintegration took place when salt was dissolved in water. The sodium ion was non-volatile; and it was an electric charge united to a sodium atom. When that reached the skin it could not get further; it could not have escaped to the air, though if there were free electrons conceivably they might escape, if there were a sufficiently high potential. Mr. Baines assumed the existence of "neuro-electricity"—namely, a stream of free electrons passing down the nerves. It was safe to assume that the body, though full of ions, had no free electrons, so that anything which demanded the presence of free electrons could not take place. The second point was, that silver electrodes were used to lead off these currents. It was impossible to get two pieces of the same metal so nearly alike that when immersed in salt solution there would not be sufficient difference of potential between them to deflect the sensitive galvanometer which Mr. Baines used. He (the speaker) had failed to get two electrodes so similar that this did not happen, though they were cut from the same bar. A difference of only 6/1000ths of a volt caused such deflection. Mr. Baines ought certainly to have tested his electrodes first. What would be the effect of placing these electrodes on different portions of the skin? Dry skin ordinarily possessed a high resistance, but when the skin was moistened its resistance was lowered, and the difference between the readings from the two constituted one of Mr. Baines's "nerve leaks." It was found that the electrodes were unequal by immersing them in salt solution, and therefore it was known that the source of the current in that case must be at the surface of the electrodes. Since one was more positive than the other, if they were changed round the current was reversed, but it did not always happen when one reversed the connexions with the galvanometer. This Mr. Baines insisted upon as a proof of the occurrence of nerve leaks. The reversal when changing from one hand to the other showed there must be a source in the body itself. Another proof that there might be a source of electromotive force in the skin itself was by using not metallic electrodes, but by employing what physiologists called non-polarisable electrodes, which could easily be made equi-potential, so that the electrodes themselves gave rise to no current at all; hence anything observed was due to something in the skin. But Mr. Baines would have nothing to do with non-polarisable electrodes, though the reasons he gave were very difficult to understand. Still, he said that was the reason no advance had been made in electro-physiology since 1877. The answer to that was, that one could not get a true representation of electrical changes in a structure like the human body unless one used electrodes which were not polarisable. What was the source of electromotive force in the skin? Clearly, the activity of the sweat glands was associated with this change, and one could not be sure of the degree of activity of these glands in any part where one led off. This accounted for Mr. Baines's second kind of nerve leak. It added itself on to the first one. Why were these "nerve leaks" more easily detected in cases of shell shock and other neurasthenic conditions? A Russian physiologist found that various mental states were associated with various localised activities of sweat glands. The changes in the electromotive activity of glands and other tissues in the body were explained most readily by the presence of a membrane which allowed one kind of ions to pass through, but did not allow other kinds to do so; it might be due to its own electrical charge or to the size of the pores. But they could not leave the neighbourhood of the membrane because of the influence of the oppositely charged ion inside the membrane. The second kind of nerve leak was more genuine than the first, but it had nothing to do with the escape of neuro-electricity. With regard to the question of static charges that was a difficult question, as was also that of inductive capacity. Mr. Baines evidently meant by a static charge what happened when one stood on an insulated stool and charged the body from a source of static electricity. But that did not influence any process going on inside; he had tested the point with a galvanometer. The static capacity was of no importance in the physiology of the human organism. The inductive capacity puzzled him a great deal, for he did not know what was to prove that the body had an inductive capacity. "Neural electricity" Baines defined as "a form of energy resembling, but not identical with, electricity"; but in another place he spoke of neural electricity as circulating in the coils of the galvanometer. If it were ordinary electricity, the tying of the cut ends of a nerve and surrounding it with an insulator would result in its conduction as if it were not cut. But everyone knew such was not the case, and no muscular contraction followed. Most probably it was associated with some kind of polarisation of membranes—i.e., movement of ions. As to the practical application based upon these theories, if the conditions described were due to leakage of nerve energy, and that energy was a form of electricity, applying an insulator would cure the case. The author included in conditions favouring leakage inflammatory states such as pneumonia, the reason being that inflammatory cells were not properly supplied with nerve energy. Baines said that if any cell or group of cells was isolated from nervous influence and control the whole of its activities ceased in a short time. But was it true that cells and tissues would not behave normally unless they were in association with the nervous system and receiving a perpetual supply of nerve energy? Clara Jacobson, in America, tested the rate at which wounds made on opposite legs of an animal healed, when the nerve-supply to one was cut and that to the other remained intact; and she found no difference in the rate. The whole theory of nerve energy rested on the erroneous assumption that energy was present in the nervous system to only a limited extent; so that energy used in one way left less for other purposes. Baines used "dielectric oil" to stop the nerve leaks, and this was found to be fairly good quality liquid paraffin, which had been dried, probably by the application of heat to it. It was claimed that the process employed conferred upon the paraffin properties which could not be detected by any chemical or physical means. The obvious answer to that was, that if the properties could not be detected it was of no use making the statement that they were there. The great penetrating power of this dielectric oil on the skin—it was said, when applied for pneumonia, to go right through the chest and appear on the bedclothes at the back—rested upon very inadequate evidence. To test this penetration Professor Bayliss allowed a pad to soak on the skin and tested the electrical resistance between the part soaked with paraffin and another part, but during three hours there was no change of resistance. To

state that the temperature of a case of pneumonia fell after its application meant nothing, for a fall of temperature in that disease was often quite spontaneous. Professor Bayliss summarised the conclusions he had reached on the matter as follows. The currents led off from various parts of the body by metallic electrodes were due to the inequality of the electrodes and to differences in the activity of the skin glands. Neither static charges nor induction played a part in the phenomena. "Nerve leaks" were merely places at which the skin was moist. The view that neuro-electricity is generated in the brain, and escaped from nerves owing to a breakdown of insulation was devoid of evidence and contrary to our knowledge of physiological processes.

In the ensuing discussion Dr. AGNES SAVILL said she had had very little experience with the "dielectric oil," but it had been good. She quoted the case of a lady who had eczema of both feet, to an equal degree in each, and the foot on which the dielectric oil was used healed quicker and was less irritating in the process than was its fellow.

Captain HERNAMAN-JOHNSON spoke of the value of the method in diagnosis. He took two cases to be tested by it, the natures of which were unknown to Dr. Hill Wilson, who saw them for the purposes of the test. One, a case of chronic dysentery, showed a violent deflection of the mirror when the mid-dorsal region of the spine was reached. The other was diagnosed as having something wrong with the pelvic organs; it was a case of dysmenorrhœa followed by amenorrhœa. He did not think the question of unequal moisture of skin played a part, because the skin was previously rubbed with a rough dry towel.

A number of questions were asked, to which Professor BAYLISS replied.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

Exhibition of Specimens.—Total or Sub-total Hysterectomy for Removal of Myomata.—Curious Degeneration of Cervical Tumour.

A MEETING of this section was held on March 1st, Dr. G. BLACKER, the President, being in the chair.

Dr. CUTHBERT LOCKYER showed: (1) Specimens illustrating Simultaneous Pregnancy in each Fallopian Tube; and (2) a Metastatic Glioma (Neuro-epithelioma) of the Ovary in a child of 3 years.

Dr. HERBERT SPENCER read: 1. A paper on two cases of Supravaginal Amputation for Sarcoma Mistaken for Myoma. The patients recovered, but the disease recurred. The operations were performed 17 and 20 years ago. It was these two mistakes in diagnosis which led him to study the relative advantages of amputation and total hysterectomy, and to decide very strongly in favour of the total operation. 2. A paper on four cases of Undiagnosed Cancer of the Cervix in 200 Total Hysterectomies for Myoma. All the cases were squamous carcinoma; two were very early and high up in the cervical canal; the others more extensive, but out of reach on account of the presence of pelvic tumours. The first died from heart disease within a year of the operation; the second remained well after six years; the third remained well for five years, but died of recurrence after nearly six years; the fourth recurred within a few months. He appealed to the advocates of supravaginal amputation for a comparative record of 100 or 200 cases followed up and examined for five years after operation. He had not himself performed this operation for the last 16 years.—The PRESIDENT said that the question whether total or subtotal hysterectomy was the best operation for the removal of fibro-myomata of the uterus was one of great importance. With sarcomatous degeneration of such a tumour, however, the question was not so important as it was when a carcinoma developed in a fibroid uterus. So far as he knew, the cases recorded in the literature showed that the chances of recurrence were equally great, whether the cervix was retained or not. He asked if the recurrence had involved the cervix in the two cases recorded by Dr. Spencer.—Dr. H. R. ANDREWS stated that he had at one time performed panhysterectomy as a routine operation for fibroids, but for the last 10 years had removed the whole cervix only in cases in which laceration and eversion of the cervix made it probable that there would be persistent discharge if the whole cervix was not removed. His practice was to scoop out most of the cervix, and in doing this he had only once found unexpected carcinoma, although he had removed many uteri which contained both fibroids and carcinoma. During the last eight years 761 hysterectomies for fibroids, chiefly subtotal, had been performed at the London Hospital. Dr. Andrews and the late Dr. R. D. Maxwell had been for many years on the look-out for carcinoma occurring in the cervix that had been left behind, but no such case had been seen at the London Hospital.—Dr. T. W. EDEN remarked that two of Dr. Spencer's cases, although in a very early stage of the disease, died from recurrence, and it could not be doubted that an extended hysterectomy (Wertheim) would have given them a better chance. To be consistent, Dr. Spencer should have advocated Wertheim's operation instead of panhysterectomy.—Mr. J. D. MALCOLM said that he had for many years removed the whole uterus in operating for fibromyoma after seeing two cases in which he had attributed septic trouble to a spread of infection from the cervix uteri.—Mr. T. G. STEVENS said that in his opinion the appearances seen in the microscopic sections of Dr. Spencer's first two cases were those of erosion of the cervix.—Dr. SPENCER replied.

Dr. C. HUBERT ROBERTS read a short paper on a Curious Degeneration of a Cervical Tumour removed from a patient aged 35 years. He also showed a specimen of a Calcified Fibroid causing complete axial rotation of the uterus; an account of the case is published on p. 454 this week.

Reviews and Notices of Books.

Syphilis and the Nervous System. By Dr. MAX NONNE. Translated by CHARLES R. BALL. Second American edition. London and Philadelphia: J. B. Lippincott Company. 1916. Pp. 450. Price 18*s.* net.—This edition of Dr. Nonne's classical work is based on the third German edition of 1915. The six years which had elapsed between the appearance of the second and third German editions have seen the *Spirochæta pallida* given its proper place in the causation of general paresis as well as of tabes, and the portion of the book dealing with this subject has therefore largely been rewritten. But the general arrangement based on clinical lines has been retained and constitute the value of the work as a useful guide to practice. Some minor blemishes remain unaltered from the last edition and may probably be due to the great distance by which author and translator are separated. The appearance of a new edition is timely.

A Historical Sketch of the General Infirmary at Leeds. Leeds: Richard Jackson.—This little book tells the story of the General Infirmary, Leeds, from its inception in 1767. At this time a house was rented at £16 per annum, two physicians and four surgeons were appointed, as well as a matron and nurse at the princely salaries of £10 and £5 a year respectively. Among the first surgeons to the infirmary was a pupil of John Hunter, Mr. William Hey, F.R.S., to whom the honour of founding the institution is in large part due. A century later, that is, between 1869 and 1901, the infirmary was rebuilt at a cost in land and buildings of approaching £230,000, and a further extension was carried out as a memorial to the late King Edward at the added cost of £150,000. The number of in-patients rose from 76 in 1768 to 6071 in 1900 and to 9703 in 1915, and these figures show better than words the remarkable growth in a century and a half of an institution with which have been associated the names of many well-known physicians and surgeons. The story, which is illustrated with portraits of the founder and others associated with the infirmary, has been compiled from annual reports and makes no pretence to completeness. It gives, nevertheless, a worthy account of a great institution.

Pharmacology and Therapeutics. By HORATIO C. WOOD. Second edition. London and Philadelphia: J. B. Lippincott Company. 1916. Pp. 455. Price 18*s.* net.—The new edition of this text-book has been held back to await the appearance of the new U.S. Pharmacopœia, which has necessitated a complete revision of its contents. The articles on such products as veronal, pituitary extract, and salvarsan have been rewritten, and a number of substances such as bromural, picrotoxin, and thiosinamin considered for the first time. The author welcomes the adoption of the term mil in place of c.c. for the thousandth part of the litre. The book will be of interest to all whose reading takes them outside the statutory requirements.

Representative Procedures in Quantitative Chemical Analysis. By FRANK AUSTIN GOOCH. New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Limited. 1916. Pp. 262. Price 8*s.* 6*d.* net.—We have presented here by a well-known authority on the subject a valuable series of analytical methods applied to inorganic substances; the particulars of procedure described give trustworthy and accurate results in the light of the latest experience. We are glad to note the author's appreciation of "the beauty and accuracy" of the iodometric processes, and he has given a much more extended treatment of this section of the subject than is usually the case in analytical text-books. The clear and careful directions set out mark the experienced hand at analytical work. Useful ground is covered in regard to procedures in both gravimetric and volumetric analysis, but in the latter section we find no reference made to the convenient reduction methods in which titanium salts are used as reducing agents.

The Motor-car. By T. O. A. LAWTON and R. J. HARVEY GIBSON. London: Edward Arnold. 1917. Pp. 87. Price 1*s.*—This is a simple little primer that takes the intending driver by the hand, so to speak, like "Little Henry's Guide to French," and leads him step by step to knowledge and, if coupled with practical instruction, to the confidence that should justify him in taking the road unaided. It is all very elementary. Whether such aids are more easy to understand than the usual text-books is a question.

Organo-therapeutic Products. Issued from the Bacteriological Research Laboratories of Evans Sons Lescher and Webb, Limited, Higher Runcorn, Cheshire. February, 1917. Pp. 60.—With this catalogue and price-list of their organo-therapeutic products the manufacturers have incorporated 10 pages of text describing the principles of hormone therapy and 40 pages more on the preparation and uses of organ extracts. The notes are well printed and well arranged, and will afford the busy practitioner useful information on the therapeutic material available in this still somewhat obscure region of medicine.

JOURNALS.

The Philippine Journal of Science, Section B, Tropical Medicine. Vol. XI., No. 3.—Dr. Edward S. Ruth writes on the development of twins and other polyembryos with special reference to four sets of duck twins. After reviewing the work done already on the subject, this observer, in a series of approximately 500 duck eggs that were incubated for embryological material, found four sets of twins. One set had developed to the 3-somite stage and the other three sets respectively to the 9-, 11-, and 12-somite stage. In only one set were the embryos completely separated from each other; in the others the embryos were joined along their lateral sides and would in all probability have developed into joined twins. The underlying causes involved in the formation of twins and other polyembryos are obscure. It has, however, been definitely shown that in some anamniotes twins, triplets, quadruplets, &c., can be produced by mechanical and chemical changes. These definite results have been obtained by altering the environment by external agents. If the intrinsic factors be considered, Dr. Ruth thinks that little imagination is needed to conceive of distorted embryos, twins, &c., as being due to a faulty metabolism or to some physical law that is so wrapt up in physio-chemical processes that it is still impossible to solve the mystery. This paper is illustrated by three plates.—The influence of fresh and autoclaved cow's milk on the development of neuritis in animals is discussed in an article furnished jointly by Dr. R. B. Gibson and Dr. Isabelo Concepcion. They were led to make experiments by the fact that the use of "canned whole cow's milk" for feeding infants is rapidly increasing in the Philippine Islands, and they sought to obtain information as to whether or not the antineuritic vitamines of milk are destroyed by heating. It would appear from previous experiments that antineuritic properties, if present in milk, exist only in very small amounts, and in none of the observations already reported has milk prevented the development of neuritis. Accordingly, the authors directed their attention to ascertaining by feeding experiments whether or not antineuritic substances were present in milk, and to what extent these would be affected by autoclaving the milk for two hours at 125° C. The first observations were made on fowls, but subsequently on young dogs and pigs. The results on the latter animals indicated that autoclaving the milk did not affect appreciably either the growth promoting principles in it or the nutritive value of the caseinogen. The antineuritic vitamine is present in milk in slight amount, and continued feeding of dogs and pigs with either fresh or autoclaved milk, without suitable additions to the diet, induced certain beri-beri-like symptoms, such as degeneration of the peripheral nerves, persistent œdema, and aphonia. There was no evidence that autoclaving milk for two hours at 125° C. affected in any way its nutritive value. The authors remark, in conclusion, that at the best the antineuritic powers of the milk are so slight that in infant feeding the diet should be extended as soon as possible. They further suggest that the young of healthy mothers probably come into the world with a reserve supply of the vitamine substances sufficient to tide them over nutritively until the time when, under natural conditions of life, they would begin to eat other food. This article is illustrated by two plates.—The remaining contribution to this number of the *Journal* deals with the blood pressure picture of the Filipinos, and is supplied jointly by Dr. Isabelo Concepcion and Dr. Emilo Bulato. Little work on blood pressure has previously been done in the Philippine Islands. The authors give details of the observations they made by the graphic method with the Erlanger sphygmomanometer on 717 persons whose average age was 28·5 years. Their findings showed that the systolic pressures of Filipinos were very much lower than those of Americans. The average pulse pressure was 36·4 millimetres in males and 32·6 in females; there was a general rise of systolic, diastolic, and pulse pressure with age. For a given age the systolic pressure is more variable than the diastolic. The pulse pressure does not differ very much between the different ages, and persons with blood pressure below 20 or above 50 millimetres are probably abnormal. Hypertension is not a necessary accompaniment of old age. The pulse-rate of Filipinos averaged a few beats above the usual standard of 72 per minute. Examination of 65 persons addicted to the opium habit showed that in all of them the blood pressure averages were lower than normal.

The British Journal of Ophthalmology. Vol. I., Nos. 2 and 3 (February and March).—These numbers of the new journal contain several interesting original papers. Colonel R. H. Elliot publishes a paper read at the Oxford Ophthalmological Congress on Some Eccentricities of Indian Ophthalmic Practice. It deals with the grave injuries to the eyes inflicted by the use of primitive methods of treating conjunctivitis, trachoma, corneal opacities, and so on, and its debonair style is somewhat ill-suited to the recording of tragedies.—Captain J. A. Pringle reports a good case of multiple aneurysms of a retinal artery, associated with opaque nerve fibres. This paper is illustrated by an excellent coloured plate.—The report of a case of quinine amaurosis by Dr. Arthur J. Ballantyne is particularly noteworthy in that an early stage was observed in which the retinal arteries were not constricted, as is almost invariable in this form of poisoning. The case is very carefully discussed and good reason is shown for the view that the blindness is due to the direct toxic action of the drug upon the retinal elements, and not, as has been generally thought, to ischæmia.—There is a noteworthy sketch of the life of William Mackenzie (1791-1868), the great Glasgow ophthalmologist, by Dr. J. Freeland Fergus. The author writes his name "McKenzie," though he is generally known as Mackenzie, and this is the mode in which his name appears upon the title page of his own treatise on Diseases of the Eye. The facts of Mackenzie's life are well set forth, but the paper gives the impression of a somewhat grudging tribute to his genius. To state that he "has left practically nothing which will be permanently associated with his name" is an admission of the shortness of human memory and of the transitoriness of fame. To say that "he was not an investigator" is to detract from one of the greatest clinicians that ever lived. His original observations were far more numerous than Dr. Fergus gives him credit for, and they were so accurate that they are taught as the commonplace knowledge of to-day. Amongst the many abstracts of papers contained in these two numbers there is a valuable series on war injuries. The proprietors of the *British Journal of Ophthalmology* are to be congratulated on the success of their magazine in spite of the unusual difficulties produced by the war. That it is indispensable to ophthalmic surgeons and is not without its appeal to a wider circle are matters on which we congratulate the editor and his supporters.

Endocrinology. Vol. I., No. 1. January, 1917.—The first number of this new quarterly, published by the Association for the Study of Internal Secretions (secretary, Dr. Henry R. Harrower, Glendale, California; subscription $5 a year in advance, single copies $1 50 post paid), contains an introductory article by Lewellys F. Barker, of Baltimore, who believes that its appearance will be welcome to clinical and laboratory investigators, as well as to the "more alert general practitioners, for these men already realise the profound importance of an intimate knowledge of the ductless glands and their functions for everyday work in diagnosis and therapy." C. E. de M. Sajous, of Philadelphia, contributes an editorial article on the Future of the Internal Secretions, in which he describes organotherapy as opening up avenues of thought to a new conception of medicine which will satisfy the longing for logical reasoning and rationalism. He believes with Abderhalden that the tissue cell disposes of the same or similar ferments to those secreted by the digestive glands and that the leucocytes are the carriers of these ferments. Other brief editorial articles are written by Tom A. Williams, of Washington, and Henry R. Harrower, of Los Angeles. Three original articles follow: the first by Dr. Emile Sergent, physician to the Charité, Paris, calling attention to the "ligne blanche surrénale," which suggests to him the search for other signs of "hypoadrenia." The rest of the volume is occupied by 60 pages containing nearly 200 brief abstracts and reviews of articles on internal secretions in the medical journals of the world.

THE CONTROL OF VENEREAL DISEASES.

Civilian Treatment Centres in France.

IN his recent book on the problems of syphilis under French military régime ("La Syphilis et l'Armée." Paris: Masson et Cie. 1917. Price 4 fr.), Dr. G. Thibierge devotes a section to the creation of treatment centres for the civilian population. In Paris medicaments for the treatment of syphilis have long been distributed on a large scale at the special hospitals of St. Louis, Broca, and Cochin. From 1902, when mercurial injections became general, Dr. Thibierge and Dr. Brocq greatly extended the out-patient treatment of syphilitic women at the Hôpital Broca, other hospitals following suit with similar polyclinics. Sunday and evening consultations were arranged to suit all, and no pressure was placed on the patients to attend. Similar services were arranged in most large towns. In March, 1916, these services were still further extended on the advice of Inspector-General Vaillard and M. Brisac, director of assistance and public hygiene, and it was decided to institute dispensaries, called *services annexes des hôpitaux*, in every district where there was a call for them, gratuitous treatment to be provided under conditions of strict secrecy and with the help of military doctors if civilian practitioners were not available. In a circular dated May 31st, 1916, the Minister of the Interior instructed departmental prefects to bring pressure on local sanitary authorities to institute centres, and assured them of financial help from the State. Dr. Thibierge states that only in a few cases were the authorities recalcitrant, and that the number of patients attending the centres has increased with great rapidity. He mentions Dr. Pautrier, of Bourges, as an enthusiast whose example has set the tone of the work in general.

Port of London.

The City Corporation is starting a treatment centre at the Royal Albert Docks at an estimated cost of £600.

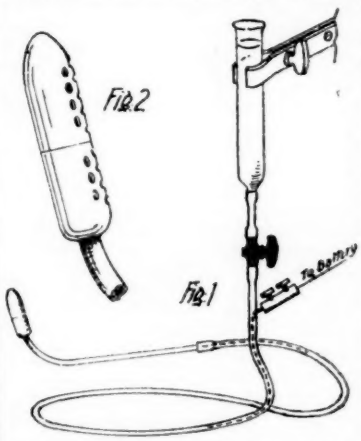
Publicity.

Dr. Harold Kerr, medical officer of health for Newcastle-on-Tyne, has issued a circular, published in full by the local press, calling attention to the facilities provided for treatment as well as to the need for such treatment. He asks all into whose hands the circular may come to use their "personal influence to promote the knowledge of good and evil that alone can save many from the consequences of ignorance," and to assist the sanitary authority by making the facilities provided widely known.—Following on an address given by Sir Francis Champneys at a public meeting in Glasgow on March 12th, a local branch was formed of the National Council for Combating Venereal Diseases. The suggestion was made that further branches should be established at Edinburgh, Aberdeen, and Dundee.—Sir Malcolm Morris and Sir Thomas Barlow addressed a meeting of ministers of religion at the Small Queen's Hall on March 9th on the necessity for their coöperation in the campaign of publicity and enlightenment.

New Inventions.

AN ELECTRODE FOR THE IONIC TREATMENT OF PROSTATIC ENLARGEMENT.

I HAVE found that the enlarged prostate can be treated successfully by ionisation, and have designed an electrode for the purpose. The negative wire from the battery passes by a terminal right through the tube conveying the fluid down to the bulb of the instrument. The stem of it is insulated as far as the bulb, thus ensuring that no contact is made with the lower part of the rectum. The bulb is lubricated with glycerine and passed into the rectum well on to the prostate. The current I use is 20 milliamps for half, increasing to one, hour on alternate days. As some irritation may be caused by the introduction of the bulb I have occasionally found it necessary to have the patient introduce a ¼ gr. morphia suppository half an hour before coming to me. Three to six months are required to effect the reduction, according to the age of the tumour. One case of ten years' standing took nearly twelve months. I was able to send away a man of 50 with a perfectly normal prostate and able to urinate freely, after only three months' attendance, but his condition was of only eighteen months' duration.



The instrument illustrated (Fig. 1) is designed to carry out the principle that there should be a constant supply of the fluid from which it is proposed to derive the ions at the seat of application. The face, which is perforated with a number of small holes (Fig. 2, shown on a larger scale) is pressed on to the prostate, and the hollow bulb (which unscrews in the centre) is packed lightly with cotton wool sufficient to ensure a steady trickle of fluid from the reservoir (the cylinder of a 2-ounce syringe inverted), on which a vulcanite tap regulates the outflow so that just sufficient runs down to last for the period of the sitting. Ten grains of potassium iodide dissolved in 2 ounces of sterilised water is the usual quantity.

Sydney, N.S.W. LEIGHTON KESTEVEN, M.R.C.S. Eng.

BRISTOL HOSPITAL SUNDAY FUND.—Up to the present £2252 have been received as a result of the Hospital Sunday collections in Bristol, and of this sum £2000 have been awarded to the local medical institutions.

THE FOOD PROBLEM.—Lecturing on the "Food Problem" at the Institute of Hygiene on March 15th Mr. J. Grant Ramsay, principal of the institute, said that both health and money would be saved by a better knowledge of food values, while, in addition, the public must be brought to realise that internal waste—i.e., food that could be done without—represented a squandering of health as well as of food. Mr. Ramsay detailed his proposal of a ration-book which had been submitted to the Ministry of Foods. This was to be a compulsory housekeeping book issued officially, in which all foods bought would be entered by the tradesman. The housekeeper would be saved from making the entries and the tradesman from drawing up any other account. Such a ration-book would provide an exact record of food bought, induce care and economy, and allow each individual to claim his fair share of rations.

THE LANCET.

LONDON: SATURDAY, MARCH 24, 1917.

"War Nephritis."

IN a recent discussion at the Royal Academy of Medicine in Ireland Dr. T. GILLMAN MOORHEAD and Dr. R. J. ROWLETTE took the view that the condition thus described is due to an infection, an impression which seems to be gaining ground among many observers. Dr. W. M. CROFTON related six cases in which he had administered a vaccine from organisms obtained from the urine with apparent benefit, but, as pointed out by other speakers, it is difficult to substantiate this claim in a disease which tends to spontaneous improvement. Some important observations have been made by TRÉMOLIÈRES and CAUSSADE on the renal functions in these cases.[1] They employed three tests for renal permeability—the effect of injections of indigo carmine, the elimination of chlorides, and the estimation of the urea in the blood. In this country the two methods have been employed in war nephritis by Mr. J. TREVAN at St. Bartholomew's Hospital, but as far as we know the indigo carmine method had not been previously tried. They injected subcutaneously 4 c.c. of a 4 per cent. solution in sterile distilled water. The excretion of the dye should normally begin in 20 minutes, reach its maximum in half to one hour, and be completed in 6 to 7 hours. In war nephritis it is possible for an exaggerated elimination of the dye to coexist with chloride retention. A drawback to its use is that it may provoke hæmaturia. They noted the same effect after the administration of 10 grammes of salt, but this never occurred in the 21 cases thus examined at St. Bartholomew's. With regard to the urea in the blood, they are of opinion that the usually accepted figure of 0·04 per cent. is too high; the average for soldiers without any renal lesion was 0·0265 per cent. They do not appear to have used the estimation of urinary diastase, which was found so useful by MACKENZIE WALLIS and subsequently by ADLER. From the results obtained by applying these three methods TRÉMOLIÈRES and CAUSSADE classified the cases of nephritis as follows:—

(*a*) Cases with insidious onset; these constitute one third of the total, and they respond normally to the tests for renal permeability. The albuminuria is the only renal symptom. They can be subdivided into two clinical types. In 10 per cent. of the total the albuminuria becomes intermittent and finally disappears, and recovery is apparently complete. In 24 per cent. there is residual albuminuria which is variable in amount, and not influenced by exertion. The physical value of such soldiers is diminished, but is sufficient. Some, however, have a persistent albuminuria, which is readily increased by fatigue and dietetic excess. Such cases may be on the way to chronic nephritis and the prognosis should be guarded. (*b*) Cases with acute onset. These again can be subdivided into two groups. 44 per cent. of the total show increased elimination of indigo carmine, with retention of chlorides, œdema, and hæmaturia. These may improve to the stage of simple albuminuria with normal renal permeability or may become chronic. 14 per cent. show more extensive damage; the patients are usually above 30 years of age and complain of cramps and dead fingers. The elimination of indigo carmine is diminished, there is retention of chlorides, and the urea in the blood is increased, reaching 0·055 to 0·1 per cent. This excess of urea in the blood soon yields to a low nitrogen diet. Some of these may still be fit for military service; they have a normal heart without hypertrophy and the blood pressure is not more than 170–180 mm. They have not got chronic nephritis and their incapacity does not seem a definite bar to military service. (*c*) 7 per cent. quickly assume the features of chronic nephritis with cardiac hypertrophy, gallop rhythm, accentuation of the second sound at the aortic base and a rise of arterial tension. They are unfit for further military service. Death may occur from uræmic convulsions, pericarditis, or acute œdema of the lungs.

[1] Annales de Médecine, vol. iv., No. 1, Jan.-Feb., 1917.

It will be noted that the French authorities recommend the retention of a far larger proportion of such patients for active service than is now the practice in the British Army. By a recent Army Order all cases of nephritis among our troops are kept in hospital for three months, and if then free from albumin are only to be employed for home service. Soldiers over 38 who have had nephritis and who show any cardio-vascular change with persistent albuminuria are to be invalided out of the service. Soldiers with persistent albuminuria, but without cardio-vascular change, are not to be retained in a higher category than C3. This more cautious policy is based on the liability to recurrence which has been observed, and seems to be the wisest course.

The Moral Imbecile.

A WOMAN named ALMA COURTWRIGHT, 28 years of age, was recently convicted at the Old Bailey upon charges of robbing ladies who had engaged her as a servant, and after previous convictions for like offences had been proved against her was sentenced to penal servitude for five years. Before this was done the Court had been informed that the prisoner, after leaving prison in 1913, had been "certified as a moral imbecile," but that a Poor-law medical officer had declined to certify her as insane. The police view of the case was that she was one of the cleverest of her class, a plausible and dangerous criminal, and the judge is reported as having said, in passing sentence, that she "might be a moral imbecile," but that she was also an ingenious, clever thief. The observations quoted illustrate the attitude of the criminal law of the United Kingdom and the majority of those who administer it towards a fairly large class of prisoners, who, being without the same safeguards, are nevertheless treated by both judge and jury precisely as those prisoners are treated who show no signs of mental deficiency. That this is just cannot reasonably be asserted, but it is not a matter in which the general public is greatly interested. That it is undesirable is, however, realised by medical men more generally than by laymen. Members of the legal profession practising at the criminal bar, and judges, for the most part, display a scepticism which may be described as traditional when the irresponsibility of the committer of a criminal act is suggested, and very few lawyers not directly concerned with the administration of the criminal law are interested in questions connected with it.

In the United States of America there is a greater tendency to investigate problems relating to crime, the power of individual States to initiate their own experimental reforms independently of their neighbours contributing to produce results which, even when not wholly successful, are instructive. The Municipal Court, Chicago, which tries criminal and civil cases, more or less comparable to those heard by our magistrates and county court judges, established during the year 1914 a psychopathic laboratory, to which notice has been given in these columns,[1] and not only defendants but sometimes witnesses suspected of mental defects are referred to it by the various branches of the Court. ALMA COURTWRIGHT would have obtained more satisfactory treatment, from the medical point of view, in Chicago, for as a chronic offender she would have certainly come in for investigation at the laboratory. The difficulty of dealing with chronic offenders prompted the foundation of the institution, which has followed upon the establishment in the United States of America of various types of prisons and reformatories where industrial education is given, and of systems of releasing prisoners on probation or parole. These innovations have introduced a wide range of possible sentences for a judge to choose from, and have rendered desirable full information on his part if he is to choose rightly. Those who have instituted the laboratory have recognised this fact, and also that there exists a close connexion between mental and physical defectiveness and criminal conduct. The report of the Municipal Court of Chicago recently issued points out clearly that it is the defective born in surroundings of poverty and moral danger who become criminals. Better circumstances safeguard the defective from crime. The child of poor parents who acquires the reputation of being lazy, perverse, or stupid at school is removed thence at the earliest opportunity because he makes no progress, and is sent out to work for his living, only to find the discipline of employment even less helpful than that of school, and his deficiency still a bar to his success. He becomes used to failure, so that he expects it, as others do for him. His appetites and desires are not less than those of his normal colleagues, but he has not their capacity for inhibition and for realising the wrongness or the consequences of evil-doing, and so his downfall becomes natural and easy. But it was his poverty that largely contributed to his total failure; with money he could have been sheltered and, possibly, much improved.

The report goes on to discuss what should be done with the criminal who is found to be feeble-minded, or whose case is complicated by the diagnosis of dementia præcox, and recommends confinement for the latter class in farm-colonies under proper supervision. The question of procedure in diagnosing and eliminating the feeble-minded from the ranks of the ordinary criminal must, however, be decided before their disposal can be usefully discussed, and perhaps in some future year the example of Chicago may be found valuable as a guide. In this country we have recently passed an Act of Parliament dealing with mental deficiency in a comprehensive manner, and in more settled times the experience gained in its administration may produce good results. The case we have cited shows, however, that at present we do not deal satisfactorily with those who, though not in a condition to be confined as lunatics, nevertheless are a danger to the community owing to mental defects. Young persons who are in process of becoming thus dangerous should be our prompt care, recognising the importance of early treatment as a preventive measure. In this connexion attention may be called to the general complaints now being made of juvenile crime and depravity. It may be assumed reasonably that of the young persons of both sexes who are to-day giving trouble on an unprecedented scale, and who are stated to be unruly in the absence of their parents, or to be the victims of the sinister influences of picture palaces, or to be unable to withstand the temptations of darkened streets, some are those whose mental equipment is a little less than normal. Possibly their parents have bequeathed to them an undesirable inheritance, and, being defective themselves, have been bad educators of their offspring; at all events many of these juvenile delinquents cannot fairly be judged by normal standards.

[1] THE LANCET, 1916, ii., 1069.

Arsenic in Food Preparations.

A NOTE issued in October last year by the Chief Inspector of Foods pointing out to public analysts the desirability of examining baking powders, egg-powders, self-raising flours, and so forth, for arsenic, has been justified by subsequent events. At Maidstone, for example, the county analyst, Mr. F. W. F. ARNAUD, has reported several instances of arsenical contamination of these food preparations arising out of their containing impure acid phosphate. In two instances an excessive amount of arsenic was detected in egg-powder: it contained, in fact, 10 parts of arsenic per million, while a baking powder contained 6·6 parts per million. Two samples of egg-powder received from the local sanitary authorities were also found to contain excessive amounts of arsenic. In 26 samples of egg-powder and baking powder no arsenic was detected, but in the remainder of the samples arsenic varied in amounts from 0·1 to 3·0 parts per million. Arsenic was absent in four of the self-raising flours, but 19 samples contained it in quantities varying from 0·2 to 2·0 parts, the average amount found in these samples being rather more than 1 part of arsenic per million. The Royal Commission on Arsenical Poisoning recommended that action should be taken under the Sale of Food and Drugs Acts when any liquid is found to contain 1/100th of a grain or more of arsenic in the gallon, or when any solid contains 1/100th grain of arsenic or more in the pound. This amounts to 1·43 parts per million, a limit which will be seen is largely exceeded in some of Mr. ARNAUD'S cases. Again, at Stratford police court last week a grocer was convicted of selling baking powder which was contaminated with 1/18 grain of arsenic per pound. Our public health authorities will need to exercise increased vigilance over the food-supplies just now, for much departure from pre-war standards is allowed, and this increases the temptation to use inferior and possibly contaminated materials.

Annotations.

"Ne quid nimis."

THE EFFECT OF THE WAR ON THE SUPPLY OF DRUGS.

A VERY interesting and instructive review of the position of the supply of drugs in war time was given in a paper read before a recent meeting of the Royal Society of Arts by Mr. F. A. Hocking, B.Sc., pharmaceutist to the London Hospital. At the outset it is good to learn from one who knows that while much has been written and said concerning our real or supposed dependence on Germany for medicinal chemicals, the situation here has for the most part been described with some exaggeration. While not underrating the position of the enemy in this matter Mr. Hocking rightly says that it is not necessary to fall into the opposite error of unduly depreciating the abilities and resources of our own country. It is not true to say that Germany was the source of all drugs of any importance, and that with the outbreak of war supplies ceased. As examples opposed to this extreme view are quoted the alkaloids, the number of which, or their salts, used in the London Hospital in the year 1914 was about 15. Of these, seven—namely, apomorphine, acetomorphine, morphine, codeine, caffeine, strychnine, and emetine—were, and are, manufactured in England on a large scale, not merely for home consumption but also for export to all parts of the world, and both for quality and quantity these English products, Mr. Hocking says, rank easily first. Coming to anæsthetics and antiseptics, ether, chloroform, ethyl chloride, carbolic acid, creosote, and iodoform are produced in this country in large quantities. The same is true of alcohol and glycerine, now so urgent, however, in the production of munitions. Germany held the field chiefly in the matter of synthetic drugs; but synthetic drugs do not constitute the whole materia medica, and the more important of them—e.g., acetosalicylic acid, novocain, veronal—are now being made in England. It is further interesting to learn that the production of iodine from Chili saltpetre is largely controlled by Great Britain, and while the price of potassium iodide rose a few shillings per pound in December, it has since fallen to practically the pre-war figure. Potassium bromide is perhaps the best example of a big rise in price owing to the monopoly left in the hands of American dealers by the shutting off of German supplies. In July, 1914, the price of bromide of potassium was 1*s.* 6½*d.* per pound; at one time it reached the figure of 25*s.* per pound, and is now quoted at about 7*s.* 6*d.* per pound. France is competing with the American product by manufacturing bromine from sea water in substantial quantities. It is hoped to revive the kelp industries in Scotland and Ireland in which potash from sea-weed ash is recovered. Potash minerals have been discovered in important quantities in Spain, which later may prove to be a source of serious competition to the German industry at Stassfürt. Altogether it seems that the pharmaceutical world can get on quite comfortably without German intervention, if proper care is taken in the future to organise the drug and allied industries with the view of securing them permanent prosperity. Such a consummation would be clearly prejudiced if the following incident, quoted in the paper, be allowed to be repeated. It appears that when acetomorphine was first made and introduced in England by a Scotch firm, but little interest was manifested in it by the medical profession, whereas the same drug put on the market by the Germans under the name of "heroin" was taken up with alacrity.

REPORT FOR 1915 OF THE REGISTRAR-GENERAL FOR IRELAND.

Sir William Thompson's report on Irish Vital Statistics which has just been published contains several features of public health interest that invite special attention in time of war. In the absence of his former medical colleague the Registrar-General appears to have been solely responsible for the preparation of all reports issued since the outbreak of hostilities; nevertheless, the present volume fully sustains the high character of its predecessors. Prominent among statistical matters, it is noteworthy that the loss of population by emigration from Ireland in 1915 was proportionally the lowest on record, being only 2·5 per 1000 living at all ages, or less than half the ratio in the preceding year. The marriage-rate was the highest hitherto attained, but the birth-rate still continues to fall, being equal to 22·0 only per 1000 of the population. The death-rate at all ages, as well as among infants in their first year, was somewhat higher than in the previous year. It is satisfactory to observe in the present report a considerable amplification of the statistics of mortality in the earlier years of childhood. Great disparity is shown in the loss of infant life in the urban as compared with the rural districts of Ireland, the rate of infant mortality in the 27 principal towns averaging 134 per 1000, or no less than 92 per cent. in excess of that in the remainder of the country. If the rate of mortality in the town districts had been the same as in the rest of Ireland there would have been in 1915 a saving of 2072 infant lives. Compared with the preceding year there was an increase in the mortality from bronchitis of 1·84 per 1000 births and of 1·34 per 1000 from wasting diseases, whilst there was a decrease of 1·94 per 1000 in the mortality from diarrhœal diseases and a decrease of 0·57 per 1000 in the mortality from measles. Locally the incidence of infant mortality varied enormously. Corrected for births and deaths in institutions the rate was highest, 163 per 1000, in Dublin, 158 in Queenstown, 155 in Newtownards, and 143 in Londonderry. It was lowest, 44 per 1000, in Bray and next lowest, 64 per 1000, in Tralee. In the year under review there was, as compared with the decennial average, a fall in the aggregate mortality from common epidemic diseases except scarlet fever and influenza. The deaths from tuberculous disease numbered 9525 and were equal to 12·5 per cent. of the deaths from all causes. In the year 1910 the deaths thus returned had amounted to 10,016, but from that date onwards the number fell annually, until in 1914 they reached 9089, when they were the fewest on record. Stated in terms of population, tuberculous mortality in 1915 corresponded to a rate of 2·20 per 1000 living of both sexes, which was 0·13 above the rate of the preceding year, but still below the average rate in the preceding decennium by 0·19 per 1000. The rate was 1·5 per 1000 in England and Wales and 1·6 per 1000 in Scotland. In Ireland the male population suffered from fatal tuberculosis at the rate of 2·28 per 1000,

or 0·17 in excess of the rate in the previous year, whilst the female population suffered at the rate of 2·11 per 1000, or 0·07 above the rate for that year. It appears that the decrease in tuberculous mortality is progressing more rapidly among females than among males. About four-fifths of the deaths from tuberculous disease were ascribed to the pulmonary form of the affection, the deaths from which in 1915 were equal to 1·81 per 1000 among males and to 1·67 per 1000 among females. As in England, this disease is especially destructive to young adults of both sexes, 73 per cent. of the total deaths being those of persons between the ages of 15 and 45 years. No diminution is recorded in the mortality from malignant disease, the deaths in the year under review being equal to 88·2 per 100,000 of the population, as compared with 81·2, the average rate in the ten years 1905–1914.

THERAPEUTIC VALUE OF DIRECT SUNLIGHT ON SCURVY.

A Naval Staff Surgeon Dr. Asbeck was detailed in May, 1915, to tend the Turkish wounded in the Reserve Hospital Harbié at Constantinople, and he relates, in the War Supplement of the *Münch. med. Wochenschr.* of Jan. 9th, how in the following autumn and winter scurvy was one of the worst enemies he had to deal with. The number of wounded men was, he says, at that time so great that it was impossible to supply them all with tinned vegetables, and all grades of scurvy were in evidence, from grouped cutaneous petechiæ, favouring the thighs, to large hæmorrhages into the subcutaneous tissue, joints, and serous cavities. Wounds were brownish-black in colour with glazed surface, bled freely at each dressing, and showed no tendency to skin over. Insolation effected immediate improvement in all this and as the direct sunlight increased in intensity with the season, both wounds and scorbutic ulcers rapidly healed under the treatment, the diet remaining meanwhile unchanged. By June no case of scorbutic ulcer remained in the hospital. Alike with the local improvement the general condition mended, the patients who had all been heavy and depressed becoming gay and light-hearted after their sun-baths.

DIETARY ALLOWANCES.

THE Local Government Board has issued a schedule to the boards of guardians to help them in framing their dietaries so as to bring the consumption of flour, meat, and sugar within the scale specified by the Food Controller. No dietary tables which admit of an average consumption of those foods in excess of the scale will remain in force after March 31st next. The schedule permits three-fourths of the bread allowance to be replaced by other foods, and for this purpose the following are deemed equivalent to 1 lb. of bread or ¾ lb. of flour—namely, ¾ lb. of barley, oatmeal, rice, sago, tapioca, or maize meal; or 5 oz. of butter, margarine, or fat. The caloric value of the pound of bread is exceeded by the oatmeal allowed, and is equalled, or nearly so, by the other foods. If sago, tapioca, or the fats are used, the quantity of protein furnished is reduced, but as the dietary contains other protein-rich foods, no harm is likely to arise on this account. Any wilful waste of bread is to be treated as a breach of discipline. A pound of meat, without bone, may be replaced by 5 oz. of cheese or by 8 oz. of beans, lentils, or peas. There is less food value and protein in these than in the meat, but the liberal standards of times of peace and plenty cannot be defended at present. Some saving of sugar is also recommended by the substitution of syrup, treacle, honey, saxin, or saccharine. On the whole, when the need for stern economy is considered, the recommendations are on a liberal scale. The schedule recognises the need of elasticity in feeding children, and calls upon the medical officer to advise in the substitution of foods according to individual requirements, so as to secure that each child shall be adequately fed without waste. He is, of course, solely responsible for the food of the sick and of infants, but his attention is called to the desirability of effecting any economies compatible with their needs.

HORSE-SICKNESS OF RHODESIA.

IN the *Rhodesia Agricultural Journal* Mr. L. E. W. Bevan, M.R.C.V.S., Government veterinary bacteriologist, refers to this disease which affects horses and mules, and caused a loss of £30,000 to the colony in the year 1911. It is due to an ultra-visible virus contained in the blood, exudates, and bronchial secretions of animals affected. It is communicable to dogs by inoculation and by feeding upon infected meat. Animals that recover from the disease acquire a certain degree of immunity, but this is not complete against reinfection. Theiler found that "the serum of an immune animal which has periodically been immunised acquires immunising properties." The immunising of mules against horse-sickness has been practised in the colony since 1895. This is done by a simultaneous injection of serum and virus, and Southern Rhodesia has derived enormous advantage from it.

MEDICAL SIMILES IN LITERATURE.

ONE of the great differences presented between the general literature of the masters of the nineteenth and twentieth centuries and the works of their predecessors, both immediate and remote, is the disappearance of the medical simile. The reasons for this are well summed up in an attractive paper by Dr. W. R. Jordan in the January issue of the *Midland Medical Journal*. Dr. Jordan points out that the scholar of the Renaissance took all learning as his province, anatomy, physiology, and psychology with the rest, and used that learning to illustrate his points and exemplify the types of his creation. The medical learning of such a scholar was necessarily derived largely from the treatises of Galen and his great forerunner Hippocrates. Hence the medicine of imaginative writers from Rabelais and Shakespeare at one end to the age of Anne at the other is derived from Hippocrates; for it was at least 50 years after Harvey's great discovery before its meaning was obvious to readers as well as writers to an extent that would make the introduction of similes drawn from Hippocratic medicine appear ridiculous. Rabelais, physician as well as priest, lectured upon the works of Hippocrates and Galen, and it is natural that his immortal medley should be full of allusions to their science. The so-called First Book of Rabelais, or chronicle of Gargantua, contains elaborate anatomical remarks on page after page, and throughout all the Books a knowledge is shown by the writer, and assumed by him for the reader, of the physiology of the day. Next to Rabelais comes Shakespeare in his love of the medical simile, founded on the physiology and pathology which were universally

accepted before the publication of Harvey's discovery. Such physiology and pathology lent themselves extraordinarily well to literary similes, the reason for this being that they resolved themselves into general doctrines, supported by authority, and uncomplicated by opposing theories. Matter was composed of four or five elements having certain elementary and opposing qualities. The human body was a mixture in average proportions of these things, variations in those proportions giving rise to the different temperaments. "From the doctrine of the four elements to that of the humours is an easy translation," says Dr. Jordan, "for there was a close relation between the two; indeed, the term elements is occasionally somewhat loosely applied to the humours and also to the elementary contraries." Galen set forth the relations between the humours, the elements, and their qualities, and complicated the story by introducing the season of the year as a factor in pathology. Upon physiology and pathology of this kind Chaucer, Bacon, Ben Jonson, and especially Shakespeare, perpetually drew, while Dr. Jordan's quotations from many authors prove that numerous passages, which are quite well known, and some which are frequently quoted, lose their exact application for readers who cannot appreciate the origin of the metaphors employed or the reasons for the phraseology.

THE PROGRESS OF THE ROYAL MEDICAL BENEVOLENT FUND.

WE publish in another column a short account of the annual general meeting of the Royal Medical Benevolent Fund, which was held last week. We have regularly noted the activities of the Fund from month to month, and can assume that our readers are familiar with them; but the report, which was laid before the supporters of the Fund, presented features to which particular attention may well be drawn. The retirement of Sir John Tweedy from the Presidency was announced at the meeting, and brought into prominence the facts that during his decade of office the Fund had obtained a Charter of Incorporation and the Guild, or Ladies' Branch in connexion with the Fund, had been started. The Guild has done, and is doing, a work of steady and unobtrusive charity. The election of the honorary treasurer, Dr. Samuel West, to succeed Sir John Tweedy as President afforded an opportunity for calling attention to the organisation of the finances of the Fund, which had taken place during the 22 years of Dr. West's treasurership. Within that period the output of the Fund in charity has doubled, the invested property has risen, in rough figures, from £50,000 to £100,000, and the number of annuities granted has increased by more than 50 per cent. This is a great record of administrative work, and would by itself commend the Fund to wide support, but at this juncture a further claim is made by it upon the attention of all members of the medical profession, in order that they may use their influence among their patients. The Fund has made a War Emergency Appeal with special reference to the claim which the medical profession has on the public. Many doctors, owing to their sudden call to naval and military duty, have had to leave their practices inadequately provided for, and on their return will no doubt find them impaired by their absence despite anything which the Central Medical War Committee may desire or propose to the contrary. To meet the difficulties the War Emergency Appeal has been started, and substantial sums may have to be granted, but the amount at present available is quite insufficient. The Fund will no doubt have heavy demands made on it. The public realises the splendid services rendered by the medical profession in the war, and it is hoped that they will give the Emergency Appeal liberal support. The most effectual way in which this can be done is by medical men bringing the movement and its needs to the notice of their well-to-do patients.

THE METROPOLITAN WATER-SUPPLY.

THE issue this week of the report on the condition of the metropolitan water-supply during the month of December, 1916, concludes the monthly returns for that year. The last reports we dealt with referred to the condition of the supply during the months of August, September, and October. November was a comparatively wet month, the mean rainfall in the Thames basin being 4·28 inches, which is 1·58 of an inch above the mean rainfall for that month during the previous 33 years. The effect on all the three raw waters (Lee, Thames, and New River) was a deterioration in quality, as judged by the albuminoid nitrogen, permanganate, turbidity, and colour tests. The filtered waters likewise deteriorated in quality, according to these tests, except that the filtered water of the Lee river showed no change as regards colour. Compared with the 1915 averages all three raw waters yielded results worse than their respective averages. The filtered waters also yielded, generally speaking, results worse than their respective averages. In regard to bacteriological results all three waters contained more bacteria than their respective averages for the year 1915, but the filtered waters yielded not unsatisfactory results, 93·1, 90·9, and 56·4 per cent. of the filtered waters derived from the three river sources containing no typical coli even when 100 cubic centimetres of the water were examined. In December the mean rainfall was 3·41 inches, or 0·39 of an inch above the average for this month during the previous 33 years. Some improvement in the chemical quality of the raw waters was shown on the previous month, and compared with the 1915 averages there was improvement in the raw Thames water, but some deterioration in the Lee and New River waters. The filtered waters also showed some deterioration in quality and contained more bacteria than their respective averages for the year 1915, the results showing that 67·4, 50·0, and 41·1 per cent. of the filtered waters respectively contained no typical *B. coli* in 100 cubic centimetres.

THE house of the Royal Society of Medicine will be closed from Thursday to Tuesday, April 5th to 10th, both inclusive.

IN the Education Estimates issued on Monday last a grant of £1,000,000 is announced for the encouragement of scientific and industrial research. The dispensation of the money is vested in the hands of a committee of the Privy Council.

A PAPER by Surgeon-General Sir C. Pardey Lukis, K.C.S.I., K.H.S., M.D., F.R.C.S., on "Opportunities for Original Research in Medicine in India," will be read at a meeting of the Indian Section of the Royal Society of Arts, on Tuesday, 27th inst., at 4.30 P.M. The paper will be followed by a discussion.

REGISTRAR-GENERAL'S ANNUAL SUMMARY FOR 1916,
AND RETURN FOR THE FOURTH QUARTER.

To Sir Bernard Mallet's return for the fourth quarter of last year a considerably abridged summary is appended, giving the principal information respecting births, marriages, and deaths contributed by the local registrars in the complete year 1916. In commenting on the last quarterly return in THE LANCET of Dec. 16th, 1916 (p. 1024), we referred to the discontinuance, as a separate publication, of the familiar "Annual Summary" which had been issued from the Central Office for a large number of years. This publication has always been highly appreciated by local medical officers of health, who are thus supplied with valuable matter not otherwise available for the compilation of their annual reports. A brief analysis of the mortality tables of 1916 appeared in our issue of Jan. 27th, 1917 (p. 162). Of the total deaths 45·6 per cent. took place in public institutions in London, 29·6 per cent. in the great English towns, and 16·4 per cent. in the smaller towns. In the fourth quarter of 1916 the birth-rate of England and Wales was 20·1 per 1000 living, or 0·6 more than in the corresponding quarter of last year. The natural increase of population, by excess of births over deaths, was 46,961, an enormous drop from the figure for the year before the war, when it was 89,045. The deaths registered during the quarter were equal to 14·9 per 1000 of the assumed population. Infant mortality was equal to 99 per 1000 births, being 19 per 1000 below the average for the quarter, and, with one exception, the lowest on record for the fourth quarter of the year. In the usual table the death-rate from the several causes are given for the several towns, the figures relating to the civil populations only. Among the great towns the highest death-rates per 1000 from epidemic diseases were as follows: From enteric fever 0·31 in Burnley and 0·34 in Tynemouth; from measles 1·18 in Edmonton and 1·26 in Coventry; from scarlet fever 0·13 in Gateshead and 0·22 in Walsall; from whooping-cough 0·43 in Exeter and 0·95 in Great Yarmouth; and from diphtheria 0·88 in Carlisle and 1·00 in St. Helens. The returns of notifiable diseases show the following rates of sickness per 1000 living in London and the average rates in groups of provincial towns. The annual rate from enteric fever was 0·11 per 1000 in London, in 243 provincial towns it was 0·16, in 95 great towns 0·14, and in 148 smaller towns 0·22. From scarlet fever it was 1·61 in London, 1·99 in 243 provincial towns, 1·92 in the great towns, and 2·18 in the smaller towns; and from diphtheria 2·18 in London and 1·39 in each of the other areas.

URBAN VITAL STATISTICS.

VITAL STATISTICS OF LONDON DURING THE YEAR 1916.

In the accompanying table statistics of sickness and mortality in the City of London and in each of the metropolitan boroughs are arranged for the year 1916. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the 10 diseases specified in the table was equal to a rate of 5·1 per 1000 of the population, estimated at 4,310,030 persons; in the three preceding years the rates were 6·7, 9·0, and 7·1 per 1000 respectively. Among the various boroughs the rates last year ranged from 3·2 in Kensington and in the City of Westminster, 3·5 in St. Marylebone and in Hampstead, and 3·7 in the City of London, to 8·2 in Finsbury and in Deptford, 6·8 in Greenwich, 7·5 in Stepney, 7·8 in Shoreditch, and 8·4 in Bethnal Green. Only one case of small-pox was notified last year, against 11 in the preceding year. The prevalence of scarlet fever showed a great decline last year; 8766 cases were notified, against 25,015 and 17,104 in the two preceding years. Among the metropolitan boroughs the greatest proportional prevalence of this disease was recorded in Finsbury, Shoreditch, Bethnal Green, Stepney, and Deptford. The Metropolitan Asylums Hospitals contained 913 scarlet fever patients at the end of last year, against 4431 and 2431 at the end of the two preceding years; 8542 new cases were admitted during the year, against 23,154 and 16,327 in the two preceding years. Diphtheria was rather less prevalent than it had been in the preceding year; 8754 cases were notified, as compared with 9166 in 1915. This disease was proportionally most prevalent in Shoreditch, Bethnal Green, Stepney, Southwark, and Greenwich. The number of diphtheria patients remaining under treatment at the end of last year in the Metropolitan Asylums Hospitals was 1479, against 1663 and 1476 at the end of the two preceding years; the number of cases admitted during the year was 8683, against 8444 and 8618 in the two preceding years. Enteric fever was considerably less prevalent than it had been in other recent years, only 463 cases being notified, against 758, 779, and 647 in the three preceding years. The greatest proportional prevalence of this disease was recorded in Paddington, the City of Westminster, St. Pancras, Holborn, Bethnal Green, Wandsworth, and Greenwich. The number of enteric fever patients admitted into the Metropolitan Asylums Hospitals during the year was 324, against 415, 470, and 446 in the three preceding years; 37 cases remained under treatment at the end of the year, against 51, 68, and 50 at the end of the three preceding years. The greatest proportional prevalence of erysipelas occurred in Shoreditch, Bethnal Green, Stepney, Poplar, Southwark, and Deptford. The 277 cases of puerperal fever notified during the year included 22 in Fulham, 21 in Islington, 21 in Lambeth, 20 in Wandsworth, 18 in St. Pancras, 17 in Poplar, 16 in Bethnal Green and in South Wark, and 15 in Woolwich. The 427 cases of cerebro-spinal meningitis included 39 in Islington, 33 in Lambeth, 31 in Stepney, 27 in Wandsworth, 24 in

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING THE YEAR 1916.
(Specially compiled for THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1916.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Disease.								Deaths from all causes.	Death-rate per 1000 living.
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON	4,310,030	1	8766	8751	1	463	23	277	2383	427	192	21,792	5·1	—	815	146	604	793	15	1598	4031	0·9	61 373	14·3
West Districts:																								
Paddington	131,397	—	273	209	—	21	—	8	106	9	4	630	4·8	—	4	4	9	22	2	58	99	0·8	1839	14·0
Kensington	155,795	—	241	153	—	20	—	11	85	21	1	502	3·2	—	6	2	9	11	2	39	69	0·4	2286	14·7
Hammersmith ...	118,559	—	207	215	—	6	—	8	48	3	3	490	4·1	—	25	4	15	12	1	34	91	0·8	1642	13·9
Fulham	151,161	1	235	312	—	5	—	22	74	12	3	714	4·7	—	18	5	20	32	1	63	139	0·9	1959	13·0
Chelsea	58,421	—	108	101	—	8	—	2	28	5	1	253	4·3	—	4	—	15	16	1	19	55	0·9	948	16·3
City of Westminster	135,104	—	177	152	—	24	—	8	56	10	3	430	3·2	—	9	—	12	8	5	29	63	0·5	1782	13·2
North Districts:																								
St. Marylebone ...	100,260	—	118	134	—	13	1	—	73	8	2	349	3·5	—	7	2	6	21	3	30	69	0·7	1500	15·0
Hampstead	81,761	—	136	99	—	6	—	2	39	5	1	288	3·5	—	1	—	4	8	—	6	19	0·2	840	10·3
St. Pancras	201,322	—	441	428	—	36	1	18	112	20	9	1065	5·3	—	41	9	22	39	5	48	164	0·8	3003	15·0
Islington	316,242	—	638	538	—	32	—	21	154	39	13	1445	4·7	—	83	18	45	60	10	108	324	1·0	4782	15·2
Stoke Newington...	50,527	—	86	104	—	4	—	4	19	7	5	233	4·6	—	1	4	6	1	—	9	21	0·4	635	12·6
Hackney	217,883	—	411	359	—	23	2	8	163	24	21	1016	4·7	—	39	5	26	36	2	70	178	0·8	2857	13·1
Central Districts:																								
Holborn	40,405	—	66	99	—	9	—	2	22	3	3	204	5·1	—	3	2	10	3	—	11	29	0·7	655	16·3
Finsbury	76,915	—	201	188	—	4	—	4	59	19	4	479	6·2	—	38	2	13	12	—	39	102	1·3	1430	18·6
City of London ...	19,461	—	34	25	—	2	—	1	7	2	—	71	3·7	—	—	—	—	1	—	—	1	0·1	227	11·7
East Districts:																								
Shoreditch	103,627	—	315	304	—	11	12	3	128	13	6	801	7·8	—	34	11	20	36	5	96	202	2·0	1819	17·6
Bethnal Green ...	120,207	—	395	389	—	18	1	16	167	19	9	1008	8·4	—	22	5	25	43	2	77	172	1·4	1759	14·7
Stepney	265,731	—	729	930	—	37	1	10	245	31	12	1995	7·5	—	67	13	34	75	7	121	322	1·2	3812	14·4
Poplar	156,247	—	310	340	—	19	—	17	162	19	20	887	5·7	—	30	7	23	44	5	104	238	1·5	2511	16·1
South Districts:																								
Southwark	179,424	—	390	445	—	13	—	16	173	24	13	979	5·5	—	84	5	41	44	2	86	262	1·5	3039	17·0
Bermondsey	117,188	—	253	264	1	11	1	2	100	17	14	663	5·7	—	42	4	27	15	2	57	147	1·3	1959	16·8
Lambeth	284,188	—	513	424	—	19	1	21	114	33	12	1137	4·0	—	48	8	42	46	1	126	271	1·0	4235	14·9
Battersea	161,945	—	352	359	—	14	—	10	91	16	4	849	5·3	—	26	7	28	30	1	56	146	0·9	2187	13·5
Wandsworth	312,249	—	633	529	—	46	3	20	153	27	7	1468	4·7	—	23	5	55	50	5	67	205	0·7	3634	11·7
Camberwell	254,385	—	496	463	—	12	—	11	177	9	17	1184	4·7	—	23	10	26	31	1	86	177	0·7	3382	13·3
Deptford	110,299	—	306	255	—	6	—	5	105	6	1	683	6·2	—	33	5	13	14	1	54	120	1·1	1642	14·9
Greenwich	96,385	—	193	369	—	14	—	6	60	6	2	651	6·8	—	48	4	22	23	6	38	141	1·5	1414	14·7
Lewisham	164,438	—	305	251	—	11	—	6	73	9	2	656	4·0	—	14	1	19	23	4	45	111	0·7	1909	11·6
Woolwich...	129,505	—	226	255	—	9	—	15	92	6	—	613	4·7	—	24	4	11	32	1	22	94	0·7	1686	13·1
Port of London ...	—	—	—	3	—	6	—	—	—	—	—	9	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

Hackney, and 24 in Southwark. The 192 cases of poliomyelitis included 21 in Hackney, 20 in Poplar, 17 in Camberwell, 14 in Bermondsey, 13 in Islington 13 in Southwark, 12 in Stepney, and 12 in Lambeth.

The mortality figures in the table relate to deaths of persons actually belonging to the various metropolitan boroughs, and are obtained by distributing the deaths in institutions among the boroughs in which the deceased persons had previously resided. During last year the deaths of 61,373 London residents were registered, equal to a death-rate of 14·3 per 1000; in the three preceding years the rates had been 14·2, 14·4, and 16·1 per 1000. The lowest death-rates last year were 10·3 in Hampstead, 11·6 in Lewisham, 11·7 in the City of London and in Wandsworth, and 12·6 in Stoke Newington; the highest rates were 16·3 in Chelsea and in Holborn, 16·8 in Bermondsey, 17·0 in Southwark, 17·6 in Shoreditch, and 18·6 in Finsbury. The deaths from all causes included 4031 which were referred to the principal infectious diseases; of these, 815 resulted from measles, 146 from scarlet fever, 604 from diphtheria, 793 from whooping-cough, 75 from enteric fever, and 1598 from diarrhœa and enteritis among children under 2 years of age. The death rate from these diseases in the aggregate ranged from 0·1 in the City of London, 0·2 in Hampstead, 0·4 in Kensington and in Stoke Newington, and 0·5 in the City of Westminster, to 1·4 in Bethnal Green, 1·5 in Poplar, in Southwark, and in Greenwich, and 2·0 in Shoreditch. The 815 fatal cases of measles were 1111 fewer than the corrected average number in the five preceding years; this disease was proportionally most fatal last year in Finsbury, Shoreditch, Poplar, Southwark, Bermondsey, and Greenwich. The 146 deaths from scarlet fever were 87 below the corrected average number; the greatest proportional mortality from this disease was recorded in Islington, Stoke Newington, Shoreditch, Stepney, and Poplar. The 604 fatal cases of diphtheria were 24 in excess of the corrected average number; this disease showe the greatest proportional mortality in Chelsea, Holborn, Shoreditch, Southwark, Bermondsey, and Greenwich. The 793 fatal cases of whooping-cough were 181 below the corrected average number; the highest death-rates from this disease were recorded in Shoreditch, Bethnal Green, Stepney, Poplar, Southwark, Greenwich, and Woolwich. The 75 deaths from enteric fever were 55 fewer than the average, and included 10 in Islington, 7 in Stepney, 6 in Greenwich, and 5 each in the City of Westminster, St. Pancras, Shoreditch, Poplar, and Wandsworth. The mortality from diarrhœa and enteritis among children under 2 years of age was greatest in Finsbury, Shoreditch, Bethnal Green, Stepney, Poplar, Southwark, Bermondsey, and Deptford. In conclusion it may be stated that the aggregate mortality in London last year from these principal infectious diseases was 42·7 per cent. below the average.

(Week ended March 17th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18,000,000 persons, the annual rate of mortality was equal to 18·5, against rates declining from 22·5 to 17·1 per 1000 in the four preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 19·3, or 0·8 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 9·2 in Wimbledon, 11·3 in Rotherham, and 11·7 in Dewsbury, to 25·5 in West Hartlepool, 27·9 in Stockton-on-Tees, and 28·5 in Middlesbrough. The principal epidemic diseases caused 357 deaths, which corresponded to an annual rate of 1·1 per 1000, and included 194 from measles, 61 from infantile diarrhœa, 51 from whooping-cough, 42 from diphtheria, 6 from scarlet fever, and 3 from enteric fever. The deaths from measles showed a further increase on the numbers in the seven preceding weeks, and caused the highest annual death-rates of 2·2 in East Ham, 2·9 in Oldham, 3·4 in Walsall, and 6·5 in Warrington. The 805 cases of scarlet fever and the 1476 cases of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 6 below and 4 above the numbers at the end of the previous week. Of the 6140 deaths from all causes in the 96 towns, 196 resulted from violence. The causes of 59 of the total deaths were uncertified, of which 13 were registered in Birmingham, 9 in Liverpool, and 5 in Manchester, but only 1 in London.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death rate was equal to 18·3, against rates declining from 20·1 to 16·7 per 1000 in the four preceding weeks. The 382 deaths in Glasgow corresponded to an annual rate of 17·9, against 19·3 per 1000 in London, and included 24 from whooping-cough, 10 from measles, 6 each from diphtheria and infantile diarrhœa, and 1 from scarlet fever. The 135 deaths in Edinburgh were equal to a rate of 21·2 per 1000, and included 7 from whooping-cough, 4 from measles, and 1 each from diphtheria and infantile diarrhœa.

Irish Towns.—The 184 deaths registered in Dublin were equal to an annual rate of 24·0, or 0·3 per 1000 below that recorded in the previous week, and included 8 from measles, 3 from infantile diarrhœa, and 1 from whooping-cough. The 163 deaths in Belfast corresponded to an annual rate of 21·6 per 1000, and included 4 from measles, 2 from infantile diarrhœa, and 1 from diphtheria.

ABERDEEN DISPENSARY: ANNUAL REPORT.—The annual report of the Aberdeen Dispensary and Vaccine Institution states that during 1916 4749 cases were dealt with. In the ear, nose, and throat department 54 cases of syphilis, 42 being acquired and 12 congenital, came under observation. There was a deficit financially for the year of 6 guineas.

THE BELFAST MATERNITY HOSPITAL.—At the recent annual meeting of this old-established Belfast charity it was reported that 456 intern and 434 extern patients had been treated during the year 1916, with nine maternal deaths. The subscriptions had slightly increased. By raising a special sum of £500 the committee obtained a legacy of £500 left on these conditions. The Rev. Canon Carmody, one of the speakers, referred especially to the delay of the Belfast City Council in adopting a maternal and child-welfare scheme, as had been done by Dublin, Lurgan, Portadown, and Bangor.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

Fleet-Surg. H. B Beatty has been placed on the Retired List with the rank of Deputy Surgeon-General.

J. C. McClelland to be Temporary Surgeon.

ARMY MEDICAL SERVICE.

Lieut.-Col. G. B. Stanistreet, C.M.G., to be an Assistant Director-General (temporary).

Col. A. P. Blenkinsop, C.B., to be temporary Surgeon-General whilst employed as Director of Medical Services of an Expeditionary Force.

ROYAL ARMY MEDICAL CORPS.

Temp. Capt. C. B. Dobell to be temporary Major.

Temporary Lieutenants to be temporary Captains: T. McC. Sellar, E. Ashby, C. H. L. Rixon.

A. G. Shera to be temporary Honorary Captain whilst employed with the British Red Cross Hospital, Netley.

To be temporary Lieutenants: G. Taylor, F. G. M. Simpson, W. G. McConnell, E. G. Bark, A. W. C Bennett, E. C. Burnett G. B. Bartlett, A. H. Manfield, A. W. Hall, O. H. Bulloch, C. H. Medlock, H O'Neill, O. F. D. Airth, I. R R. Brogden, F. G. Chandler, W. J. Purdy, J. E. Foreman, R. M. Danks, J. Rae, S. M. Wilcox, M. W. Danzig, P. Cheal, W. Lumsden, H. D. McCall, M. A. Teale, A. Bevan, A. W. G. Clark, W. Templeton, J. Marshall, C. C. Kennedy, J. M. H. Caldwell.

Officers relinquishing their commissions: Temp. Hon. Major H. L. Tidy, having resigned his appointment at the British Red Cross Hospital, Netley; Temp. Hon. Major C. H. Milburn, having ceased to be employed with No. 2 British Red Cross Hospital; Temp. Capts. M. Litchfield and W. F. L. Day (on account of ill-health), and M. A. Farr; Temp. Lieuts. J. F. Young, J. B. Brown, R. C. Robinson, J. P. Ziervogel.

SPECIAL RESERVE OF OFFICERS.

Lieutenants to be Captains: J. D. Dyson, H. M. Alexander, C. A. W. Ramsay, F. B. Macaskie, F. Gamm, J. A. Murray, E. Kean, R. Chevassut, J. H. Atkinson, R. Colley, A. K. Robb, J. J. Landers, J. E. Kitchen, E. Lipman, J. C. Attridge.

To be Lieutenants: G. V. Davis (from University of London Contingent, O.T.C.), H. A. G. Dykes, J. B. Mudge.

TERRITORIAL FORCE.

Major (acting Lieut.-Col.) G. W. Miller relinquishes his acting rank on ceasing to command a Field Ambulance.

Capt. (temp. Major) R. Waterhouse to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. (temp. Major) F. Ward relinquishes his temporary rank on alteration in posting.

Capt. (temp. Major) T. H. Chittenden to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. R. C. S. Smith, from East Anglian Casualty Clearing Station, to be Captain.

Lieuts. A. E. Crabbe and J. R. Mitchell to be Captains.

R. K. Ellison to be Lieutenant.

Major C. E. Bean relinquishes his commission on account of ill-health

Attached to Units other than Medical Units.—Major W. B MacKay, C.M.G., from T.F Res., to be Major. Capt. H. W. Laing to be Major. Capt. J. A. Simpson relinquishes his commission on account of ill-health. Lieut. J. W. Anderson to be Captain. Capt. A. C. Farquharson to be Major.

VOLUNTEER FORCE.

J. O. Sankey (late Surgeon-Major, 1/4th Oxford and Bucks Light Infantry) to be temporary Captain and Medical Officer, Oxfordshire Volunteer Regiment, 1st Battalion.

INDIAN MEDICAL SERVICE.

The King has approved the promotion of the following officers:—Majors to be Lieutenant-Colonels: R. S. Peck, T. A. O. Langston. Major to be temporary Lieutenant-Colonel: G. McPherson. Temporary Lieutenants to be temporary Captains: R. C. P. Berryman, A. Williams.

The King has approved the retirement of Major G. King.

We regret an inaccuracy in our Annus Medicus for 1916 (THE LANCET, Dec. 30th, 1916, p. 1116, col. 2). It was there stated that Sir C. P. Lukis, D.G., I.M.S., was appointed to act as Director of Medical Services in India, and that the control of the whole medical service, civil and military, was vested in one officer, presumably for the duration of the war. Sir Charles Lukis's tenure of the appointment of Director of Medical Services lasted only until the arrival in India of the present Director of Medical Services, Surgeon General T. J. O'Donnell, in July, 1916.

DEATHS IN THE SERVICES.

Deputy Surgeon-General A. J. Ferguson, on March 7th at Weymouth, in his eightieth year. He received his first commission in 1858 and took part in the Afghan War of 1878–80 (mentioned in despatches and medal). He retired on half-pay in 1885.

THE CORNWALL NAVAL HOSPITAL.—The first annual report of the Royal Naval Auxiliary Hospital, Truro, which has been recently issued, shows that during 1916 1186 patients were admitted, and of that number 1024 were discharged for duty. The average number of occupied beds was 138; the average number of days in hospital was 39. The financial statement was satisfactory. Fleet-Surgeon Andrews is in medical charge of the institution, the honorary surgeons being Mr. L. C. Panting and Dr. H. C. Sharp. Dr. K. C. Chetwood-Aiken is honorary ophthalmic surgeon and Mr. H. M. Sutton is the medical officer.

Correspondence.

"Audi alteram partem."

THE CLOSURE OF COLOTOMY OPENINGS.

To the Editor of THE LANCET.

SIR,—Mr. P. Lockhart-Mummery's contribution to this subject in your issue of March 10th calls for comment. His assertion that "a temporary colotomy is a rare condition in civilian practice" is far from being correct. The general recognition on the part of surgeons that obstruction in the large intestine is best dealt with by a proximal colostomy, to be followed in suitable cases, after an interval, by resection of the offending segment of the bowel, and, later still, by closure of the artificial anus, has produced many such operations. Moreover, the established value of the three-fold operation in cases of obstruction has led many surgeons to adopt the procedure as a routine practice in dealing with cancerous growths of the colon where obstruction is not a feature of the case. My chief object, however, in writing this letter is to call attention to a method of closing colostomy openings which I have adopted in upwards of 30 consecutive cases without a single fatality and with uniform success. The method was fully described by the late Greig Smith in his work on "Abdominal Surgery," vol. ii., p. 727.

The aim of the operation is to close the artificial anus without opening the general peritoneal cavity, and this is managed by detaching from the parietes, all round the anus, sufficient peritoneum to permit of delivery of the gut through a parietal incision without separating it from its adhesions to the peritoneum. The opening is temporarily closed by a gauze plug. Incisions, each 1½ inches in length, are made above and below it through the skin and abdominal muscles down to the parietal peritoneum. They begin immediately outside the junction of the skin and mucous membrane, and may be either vertical or oblique. A finger is introduced and the muscles are gently raised from the underlying peritoneum on either side of the incisions. It is best to begin the separation at the end of the incision farthest from the anus because there are no adhesions here. Next the skin all around is divided with a scalpel one-eighth of an inch from its circumference; then with scissors the muscles are separated, taking care not to puncture the underlying peritoneum. When this has been done the colostomy opening and the adjacent colon can be lifted out of the wound to almost any desired extent. Gauze is packed in the wound all around the protruding anus and its muco-cutaneous margin is cut off. The refreshed edges of the anus are now united transversely to the long axis of the bowel by a suture of fine catgut, which should take a firm grip of both the musculo-peritoneal and mucous coats. The gauze packing and the surgeon's gloves are changed, and the area thoroughly cleansed with a stream of warm saline solution. A superimposed suture of fine silk is passed through the peritoneal and muscular coats, so as to bury the catgut suture. The loop of bowel is then pushed inside the abdominal wall, and the peritoneal wound closed by closely placed through-and-through silkworm-gut sutures. A small rubber drain-tube is placed in the centre of the wound and the usual dressings applied. The drain-tube is removed at the end of 48 hours, and in the vast majority of cases primary union results. Very occasionally a small fæcal fistula appears at the end of a week, but in every such case closure follows after a short interval. Every now and then the parietal peritoneum has been punctured, but in no case has this made any difference. Inasmuch as there is nearly always a bridge of healthy bowel wall, varying from one-third to two-thirds of its circumference, on the mesenteric side, there is not the slightest risk of a stricture forming at the site of operation.

Greig Smith's operation is applicable to the vast majority of colostomy openings, including fæcal fistulæ from gangrenous umbilical hernia and those following operations for gangrenous appendicitis. In view of its safety and the uniform success following its adoption, I may be pardoned for expressing the conviction that enterotomes and similar contrivances should be relegated to surgical instrument museums. Two of my most recent cases were soldiers who had been shot in the abdomen. They were operated on a few hours later by Captain J. Frazer, who in both cases, after suturing multiple wounds of the intestines, established an artificial anus in the transverse colon. In both the colostomy opening concerned quite one-half of the circumference of the colon. Both healed without suppuration. Mr. Paul Bernard Roth in your issue for to-day describes what he calls "a simpler method of closing colostomy openings." Admitting its ingeniousness, one is bound to recognise that it involves the resection of a segment of the colon *within* the peritoneal cavity. This procedure, owing to the relatively septic condition of the mucous membrane and the poor blood-supply as compared with the small intestine is, when every precaution has been taken, one involving a very definite risk to life, and with Greig Smith's operation as an alternative I do not hesitate to say that, in my opinion, it is quite unjustifiable.

Just a word as to after-treatment. Mr. Lockhart-Mummery recommends that the bowels should be made to act daily after the operation. Surely this is bad advice. Here, more than elsewhere, one of the essentials to good healing is rest. Care should be taken to have the bowels well emptied before operation, but thereafter for a few days the less peristalsis the better. As a matter of fact I never give an aperient in these cases until the end of the first week.

I am, Sir, yours faithfully,

SINCLAIR WHITE,
March 17th, 1917. Professor of Surgery, Sheffield University.

To the Editor of THE LANCET.

SIR,—In your issue of March 10th Mr. P. Lockhart-Mummery describes two methods of closing temporary colotomy openings. He recommends the use of the enterotome or alternatively direct suture after intraperitoneal resection. Of the enterotome I know nothing. There is little temptation to employ a method which relies for success on imperfectly regulated pressure-necrosis when better results can be obtained by measures equally safe and more precise.

I have closed a number of these openings with unqualified success both in military and civil practice and have never found it necessary to subject a patient to whatever risk may be attached to intraperitoneal resection or suture. The mode of procedure adopted has been direct extraperitoneal suture with preliminary use of the drainage-tube device of Mitchell Banks. The method is described in Greig Smith's "Abdominal Surgery," 1897, vol. ii. The description is so full and the modifications introduced in practice so trivial that nothing further than the reference is required. It would appear that this extraperitoneal method is neither so well known nor so widely practised as its merits deserve. It can confidently be recommended as of universal application, absolutely safe, and absolutely certain.

I am, Sir, yours faithfully,

Harley-street, W., March 18th, 1917. PERCIVAL P. COLE.

RATIONS GUIDE: FOOD REQUIREMENTS OF CHILDREN.

To the Editor of THE LANCET.

SIR,—In the admirable series of recommendations on rationing and "How to Save Food" recently issued by the Food Controller, there are certain recommendations made with regard to the diet of children that appear to call for revision. The recommendations of the Food Controller are based on the following statement: "Children need plentiful food. A child of 8 needs half as much as a grown-up; a girl of 12 three-fifths as much; a girl of 16 needs as much as her mother, and a boy of 16 may eat as much as his father."

I am aware that this represents the teaching of standard text-books on the subject, though I have never been able to ascertain the exact data on which the original recommendation by Atwater was founded. I venture to think, however, that this teaching is wrong and is to be deprecated as a guide at the present time. My opinion is based both on practical observation and special investigation. The food requirements of a healthy schoolboy, say of 12 years, can be fairly accurately gauged from observation and a comparison with those of his parents on the same régime. If this test be applied, it can, I think, safely be said that the average boy of 12, in a household of the professional class, eats as much as his father. Corroborative information is obtained

from the laboratory standpoint. Some time ago I made a detailed study of the actual amount consumed by healthy children in a series of medical families, every precaution being taken to ascertain the exact amount of food consumed. The ages of the children ranged from 4 to 6 years. The result showed a daily average of: Protein, 71 grms.; fat, 67 grms.; carbohydrates, 198 grms.; the total calories amounting to 1725. The supply of protein—the main food element in the dietary of children—consumed by a child of 6 years and under is shown to be greater than that allowed for by the Food Controller for a boy of 12.

Fully grown subjects may with safety and positive advantage to health accept the standard laid down for the average adult by the Food Controller. It is, however, not advisable to restrict the feeding of children to the extent indicated in the Food Controller's recommendations. A wise economy in regard to the feeding of children should be looked for in the selection of foodstuffs rather than in a reduction of quantity below the pre-war standard.

I am, Sir, yours faithfully,

Edinburgh, March 17th, 1917. CHALMERS WATSON, M.D.

THE DIFFERENTIATION OF HEART MURMURS.

To the Editor of THE LANCET.

SIR,—I fail to understand why Professor David Drummond, in his letter in your issue of Feb. 17th, should think it strange my questioning his remarks on "The Differentiation of Heart Murmurs." In the whole range of his cases I note he gives no post-mortem results, and in the absence of such surely our opinions are apt to be wide of the mark. May I remind Professor Drummond of a very interesting article with post-mortem results in THE LANCET, 1895, vol. ii., by Dr. A. G. Phear, quoting Dr. Ringer's cases. Professor Drummond apparently considers that murmurs which disappear are due to vibrations of the chest wall. In answer to this, I think Dr. Theodore Fisher rightly observes, "It is difficult quite to gather his meaning." For, as Dr. Fisher says: "The chest wall being the medium which, through the stethoscope, conveys murmurs to our ears must vibrate in all cases, but neither with functional nor organic disease can murmurs, it seems to me, originate in the chest wall." I trust I am not unduly trespassing on your valuable space in prolonging this discussion, and I would like to assure Professor Drummond I am more anxious to learn than in any way to put forward my own ideas.

I am, Sir, yours faithfully,

Bournemouth, March 19th, 1917. A. KINSEY-MORGAN.

ACUTE DILATATION OF THE STOMACH FOLLOWING GASTRO-ENTEROSTOMY.

To the Editor of THE LANCET.

SIR,—The question as to the cause of acute dilatation of the stomach following gastro-enterostomy raised by Dr. F. Godfrey in THE LANCET of March 3rd is a very interesting one, and is my excuse for publishing the following experience.

About six years ago I performed posterior gastro-enterostomy on a man aged 40 years, for duodenal ulcer and as there was a suspicion of gall-bladder trouble, the incision was made about one and a half inches to the right of the mid-line. The patient, unfortunately for the procedure, had a well-developed abdominal wall, with powerful muscles which no effort of the anæsthetist could relax; and it was found when the stomach and jejunum were drawn out and approximated for suture that there was a little tension which necessitated a slightly firmer grip of the clamps than is customary. The operation was completed, following the Moynihan technique. All went well until the fourth day, when the patient vomited slightly and complained of discomfort in the abdomen. On examination I found a distended splashing stomach. A tube was passed and about four pints of watery fluid siphoned off, which gave marked relief. Next day the procedure had to be repeated, with a similar result. The patient now looked ill and shrunken, although he was absorbing a large quantity of saline per rectum, and fearing a kink or other cause of obstruction I decided to reopen the abdomen. On doing so I found the anastomosis perfect, but the intestine on either side for a few inches was contracted, rigid, and friable, it was much discoloured and the coats thickened by inflammation. The stomach near the anastomosis was similarly affected. It was obvious that peristalsis in this area was quite impossible and the condition of the patient was thus easily accounted for. I have no doubt the state of the intestine and stomach was caused by the clamp pressure and possibly by tension on the mesentery during the operation. The abdomen was closed and the stomach-tube passed frequently to prevent accumulation until the intestine recovered tone, which it did about the eighth day. The patient then quickly recovered.

I saw him about a year afterwards; he was in excellent health and joined the Army at the beginning of the war. I have no doubt the stomach-tube saved his life. I have not heard or read of clamp pressure as a cause of atony, but I am convinced that this case is not unique, and it helps to explain at least some of the cases where vomiting occurs on the third or fourth day and the patients recover after the free use of the stomach-tube.

I am, Sir, yours faithfully,

Clonmel, March 14th, 1917. P. J. BYRNE, F.R.C.S. Irel.

TUBERCULOSIS AND THE WAR.

To the Editor of THE LANCET.

SIR,—After reading Dr. H. A. Ellis's letter on the above subject in THE LANCET of March 10th it occurred to me that it gave an explanation of the uselessness of treating patients in sanatoriums, for it would seem that a sanatorium is regarded by many as a place for throw-outs from dispensaries. If, of course, this is the intention of these institutions it is useless to deplore the absence of early cases for treatment, as the dispensary would appear to be a very efficient sieve, preventing the treatment of pulmonary tuberculosis until the patients were chronic, and probably chronics which had become acute. It is quite clear to me that if a man is unable to do anything but light work he should be sent to a sanatorium at once in order that he may be permanently cured. I would suggest, therefore, it might be a good plan to commence sending cases in Class I. at once, without the intervention of a dispensary, to properly conducted sanatoriums. I have never here found the least difficulty in treating discharged soldiers for periods of five months: my only difficulty is that many have been kept out when in what may be called Class I., with deplorable results. The least we can do for our soldiers is to provide them with real sanatorium treatment at a stage when it is possible to cure them permanently.

I quite agree with your annotation that the general practitioner should be the chief factor in looking after the tuberculous; whether the visits of a tuberculosis officer to practitioners will do any good will, of course, depend on the capacity and training of that gentleman.

I am, Sir, yours faithfully,

EDWARD E. PREST.

Ayrshire Sanatorium, New Cumnock, March 12th, 1917.

AN APOLOGY.

To the Editor of THE LANCET.

SIR,—We have the concurrence of the solicitors to the *Evening Standard* in requesting you to give space in THE LANCET to the following expression of explanation and apology to Dr. Henry Dutch which appeared in the issue of the *Evening Standard* dated March 2nd:—

THE WHITE CITY CASE.

An Explanation and an Apology to Dr. Dutch.

Our attention has been called to an unfortunate inaccuracy in the report of these proceedings appearing in our issue of February 27th. From our report it would appear as though Mr. Muir said that Dr. Dutch had told Sauge "to drop the Sergeant-Major a quid."

As a matter of fact, Mr. Muir, in making the statement quoted above, was referring to quite a different person and made no aspersion whatever upon Dr. Dutch. We much regret the inaccuracy in our report, and we are pleased to take the earliest opportunity of correcting any misapprehension and express our unqualified apology to Dr. Dutch for any annoyance caused to him.

We shall therefore esteem it a favour if you will publish this letter in your next issue.

We are, Sir, yours obediently,

HEMPSONS,

Bedford House, 33, Henrietta-street, Strand, March 15th, 1917. Solicitors for Dr. Henry Dutch.

Obituary.

FREDERICK W. HALLIDAY, M.R.C.S., L.R.C.P. LOND.

THE profession in Leeds is the poorer in many ways by the untimely death of Mr. F. W. Halliday, which occurred on March 5th at his house in Wortley, the village in, or near, which he was born, and in which almost the whole of his professional life was passed. He was educated at the Medical School in Leeds, and soon after qualifying he entered the service of the Peninsular and Oriental Steam Navigation Company, and served as ship surgeon on most of their routes in the East, retaining lively memories of India and Japan for the rest of his life. He had a widespread general practice, which he conducted with success; his kindness and courtesy were unfailing to all his patients—rich and poor alike.

During the last few months of his life he acted as medical officer to a Filling Factory, where he had the medical supervision of some 14 000 female operatives, and here his work was of the same thorough and considerate character that he displayed in private practice, and it is not too much to say that he secured the affectionate regard of the workers as well of the managers of the huge establishment. His personal friends have learned of his death in the prime of life with a great sense of loss.

WALTER DURET AUBIN, M.B., C.M. EDIN.,

LIEUTENANT-BAILIFF AND JURAT, ROYAL COURT OF JERSEY.

THE death is announced of Dr. W. Duret Aubin, in his sixty-ninth year, at his residence in Jersey on March 9th.

After receiving his early education at the Lycée of Coutances, Duret Aubin entered the medical school of Edinburgh University, where he was known as a hard-working and successful student. He graduated in 1870, just at the time the Franco-Prussian War broke out, and volunteered for service in France in the International Red Cross Society. At the close of hostilities he was awarded the Cross of that society and, later, the commemorative medal of the French Republic. Returning to Jersey, Duret Aubin settled down in practice at St. Heliers, his personal qualities soon obtaining for him an extensive general practice. At this time he entered the Island Militia as an assistant surgeon, eventually attaining the rank of Surgeon Lieutenant-Colonel. In 1895 he was elected as a Deputy for St. Helier in the island legislature and did much useful work in that position. He was instrumental in placing the local Pharmacy Act on the Statute Book and he piloted through the States other measures for the good of the community. Patriotic and full of enthusiasm at heart, he was nevertheless a courteous and conciliatory debater. In 1899 he was called to the judicial bench, manifesting there the industry, patience, and critical acumen which had marked his previous career. By the time he had risen to be deputy chief magistrate (Lieutenant-Bailiff) he had gradually relinquished medical practice, with a view of working in his public capacity, but his other activities were numerous. For many years he was President of the Hospital Committee, as also of the Jersey Boys' Home, while many local societies found in him a friend and supporter. In all his public work Durat Aubin was guided by a deep sense of duty, and in this connexion a friend of his writes: "It has sometimes been urged that medical men, as a class, do not take their proper share in public work. As a life-long friend of Duret Aubin, I may be permitted to adduce him as a conspicuous instance of one to whom this did not apply."

Dr. Duret Aubin was twice married. He leaves a widow, two daughters, and a son.

THE name of Dr. Artur Pappenheim is to be added to the already considerable list of distinguished German medical men who have fallen a victim to typhus. Dr. Pappenheim was lecturer on diseases of the blood in Berlin University and editor of *Folia hæmatologica*. He was in his forty-seventh year.

THE LATE MR. ISAAC USHER.—One of the oldest and best-known practitioners in co. Dublin, Mr. Isaac W. Usher, recently lost his life in a tragic manner, being knocked down in the street by a motor-car. He was nearly 80 years of age, and had been a highly respected medical practitioner.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Killed.

Lieut. T. W. Jones, R.A.M.C., attached Northumberland Fusiliers, received his medical education at the University of Liverpool and qualified in 1908. He had held appointments at the Northern Hospital, at the Maternity Hospital, and at the City Hospital, Liverpool, and at the time of joining up was medical officer of health, school medical officer, and medical superintendent of the Fever Hospital, Wrexham.

Lieut. A. I. Miller, R.A.M.C., attached Royal Field Artillery, was educated at Edinburgh University and qualified in 1905. Prior to joining the R.A.M.C. in September last he was in practice at Stourbridge, Worcestershire.

Died of Wounds.

Lieut.-Col. M. L. Williams, Australian Army Medical Corps, qualified M.B. at Melbourne in 1908, and was in practice at Bendigo, Victoria, prior to joining the Expeditionary Force.

Lieut. J. M. Hammond, R.A.M.C., was a medical student at St. Bartholomew's Hospital, London, and qualified in 1908. He had held appointments at the West London and at St. George's Hospitals, and was in practice at Bournemouth when he joined the R.A.M.C. in July last.

Died.

Lieut. F. G. Heard, R.A.M.C., was educated at Edinburgh University and qualified in 1889. He had held appointments at the Free Dispensary, Edinburgh, and at the Rotunda Hospital, Dublin, and at the time of joining the R.A.M.C. was in practice at Undercliffe, near Bradford, where he also held public appointments.

Wounded.

Capt. S. J. Linzell, R.A.M.C.
Capt. G. D. Newton, R.A.M.C., attached Royal Lancaster Regiment.
Lieut. A. Y. Dabholkar, I.M.S.
Lieut. E. R. Daboo, I.M.S.

Previously reported believed taken Prisoner at Kut-el-Amara, now reported Prisoner of War in Turkish Hands

Capt. R. C. Clifford, I.M.S.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Private J. M. Furnivall, Duke of Cornwall's Light Infantry, youngest son of Dr. H. W. Furnivall, of Woodbury, Devon.
Lieut. R. N. Irwin, Gloucester Regiment, younger son of Dr. S. Irwin, of Olveston, Gloucester.
Second Lieut. C. F. Umney, Dorset Regiment, elder son of Dr. W. F. Umney, of Sydenham, Kent.
Second Lieut. H. G. Downes, Royal Engineers, only son of Dr. H. Downes, of Hornsey, London.

THE HONOURS LIST.

The following awards to medical officers in connexion with the operations in Mesopotamia are announced:—

Distinguished Service Order.

Capt. Allan Watson, R.A.M.C.

Military Cross.

Temp. Lieut. A. Y. Dabholkar, I.M.S.
Temp. Capt. J. Low, R.A.M.C.
Temp. Capt. C. O'Brien, R.A.M.C.

MENTIONED IN DESPATCHES.

The name of the following medical officer should be added to the names published in THE LANCET of Nov. 13th, 1915, in connexion with operations in the Dardanelles:—

Capt. M. F. Reaney, I.M.S. (deceased).

HONITON (DEVON) V.A.D. HOSPITAL.—The mayor of Honiton recently opened a new "open-air ward" containing 30 beds, which has been added to the V.A.D. Hospital. The institution now contains 50 beds.

CONFERENCE SUMMONED BY MR. NEVILLE CHAMBERLAIN.

The Conference summoned by Mr. Neville Chamberlain, Director-General of National Service, to consider the organisation of the medical profession with a view to meeting the needs of the military and civil population in existing circumstances, was opened on March 14th and sat on March 15th also, under the chairmanship of Sir Donald MacAlister. We published last week a list of the representatives of the Central Medical War Committee, the Scottish Medical Service Emergency Committee, and the Committee of Reference of the English Royal Colleges, the three bodies through whom the Services have drawn their supply of medical officers for the war, who were present at the conference. The subjects under discussion were: First, the question of whether service to be given by members of the medical profession was to be voluntary or compulsory; secondly, what arrangements should be made for the collection and distribution of fees or other form of remuneration in cases where doctors leave their own practices or take on the practices of others; thirdly, what arrangements should be made: (*a*) centrally and (*b*) locally, for redistribution of medical men; and fourthly, what should be the relations between any central executive or advisory body representing the profession and the Department of National Service.

The report of the representatives of the Central Medical War Committee upon the proceedings of the Conference was received by that Committee during the week, but no set discussion followed, it being understood that the views of the Conference were largely those already expressed in the published resolutions of the Committee.

We are precluded from suggesting more definitely what actual course will be pursued, or what form any necessary legislation may take, until the Director-General of National Service is able to communicate the view of his Department. But as far as the demand on the medical profession is concerned, a largely increased number of medical officers is now stated to be required for the Army; and, as the War Office contemplates not being able to keep back any officers of military age from general service, it is clear that many openings for those above that age may be created.

THE MOBILISATION OF THE MEDICAL PROFESSION.

A meeting of registered medical practitioners in Glasgow and the West of Scotland will be held in the Faculty Hall, St. Vincent-street, Glasgow, on Tuesday next, March 27th, at 4.30 P.M., when the opinion of the medical profession will be invited upon the following points: (*a*) Does the meeting approve of the principle of the immediate and compulsory mobilisation of the whole nation (due regard being paid to age, training, and circumstances), to secure the successful and rapid conclusion of the war? (*b*) Does the meeting approve of the medical profession being so mobilised, in advance of the community? And (*c*) if the medical profession is to be mobilised, is the meeting satisfied with the arrangements which already exist, centrally and locally, for the redistribution of medical men and for administrative purposes generally?

EDUCATIONAL FACILITIES FOR BRITISH PRISONERS OF WAR.

At a representative and largely attended Conference of Examining Bodies in Great Britain held on March 15th at the Board of Education under the presidency of Mr. A. T. Davies, C.B., chairman of the British Prisoners of War Book Scheme (Educational), it was unanimously decided, on the motion of Sir Edward Busk, Chairman of Convocation of the University of London, to approve proposals for the recognition of the studies pursued by prisoners during their internment. Steps are being taken to give effect to these proposals, and various examining bodies, including most of the universities, have already intimated their willingness to recognise work done and examinations passed in the camps and to extend to the men, on their return, facilities for sitting for examinations under conditions which will take account both of their special circumstances and their needs. A message was read from the President of the Board of Education, in which Mr. Fisher expressed sympathy with the objects of the Conference and his belief that the result of its efforts would prove a great encouragement to the men to use wisely and well the time of their captivity, and, further, would be of material assistance to them on their return to this country. It is intended that the decision arrived at shall be communicated as soon as possible as "a message of encouragement and hope" to the various internment camps in enemy and neutral countries. Meantime it was suggested that friends and relatives of student prisoners might do them a service if, when writing to them, they will draw their attention to the steps in this connexion which are being taken on their behalf.

RED CROSS WORK IN THE COUNTY OF LONDON.—In his report for January the county secretary of the British Red Cross Society states that a lecture given by Colonel James Cantlie to women conductors of the London General Omnibus Company was greatly appreciated by them, and that the company have made arrangements for a regular course of lectures to their women employees in first-aid work. A new division of the Red Cross Society has been formed at Southwark. Mention is made of the good work done by different detachments at the recent explosion in a munition factory. In the examinations held during the month 185 candidates passed and 26 failed in first-aid, while 82 passed and 5 failed in home nursing.—In the February report all members of the V.A.D. are exhorted to consider themselves as recruiting agents and to enrol as many members as possible. The difficulty in supplying an adequate number of lecturers for first-aid and home-nursing courses is to be met by asking those desirous of qualifying for Red Cross work to attend lectures at the College of Ambulance (3, Vere-street), where full facilities are afforded. In the February examination 131 candidates passed and 21 failed in first-aid, 93 passed and 9 failed in home nursing, while all of 3 passed in hygiene. The total number of candidates for examination under the central examination scheme inaugurated in July, 1916, was 1324 up to the end of last year, the percentage of passes being 88.

FRENCH CONSERVATIVE SURGERY.—Dr. Louis Mencière, a paper by whom on the treatment of gas gangrene when he was médecin-chef of the Hôpital de la Compassion, Rheims, was published in THE LANCET of Sept. 11th, 1915, has just been made Chevalier of the Legion of Honour and chirurgien-chef at the Grand Palais Hospital in Paris. His mission is to continue his scientific researches and to popularise his method of treatment of war wounds. Professor Sartory, who occupies the chair of chemistry and bacteriology of the Faculty of Medicine of Nancy, is associated with him, and the Army laboratory at the Invalides has been placed at their disposal. Dr. Mencière's well-earned promotion is a direct result of the success of his conservative methods in saving numberless amputations, which won the approval of General Nimier, médecin-inspecteur of the VI. Army.

WAR DRAWINGS.—Mr. Muirhead Bone's recent drawings in France are being reproduced by authority of the War Office under the title of "The Western Front." In addition to this publication a selection of drawings will be reproduced on a larger scale (20 in. × 15 in.) to give full effect to the artist's work. "War Drawings" will consist of a series of parts each containing ten illustrations. The drawings will appear as nearly as possible in facsimile, printed in one, two, or more colours according to the character of the originals. It will be possible to obtain separate plates from this publication.

HOT WATER FOR THE TROOPS IN THE FIELD.—An illustrated pamphlet issued by the British Berna Motor Lorries, Limited (Waterloo-place, S.W. 1), gives details of the type of bath caravan manufactured by them, one of which has been presented by the Wounded Allies Relief Committee to the Belgian Army. The caravan carries 12 enamelled steel baths and a boiler capable of yielding hourly 50 to 60 baths of 20 gallons each at a temperature of 110° F. More than 500 men can thus within a period of 12 hours enjoy a separate hot bath under conditions of comfort at a cost of approximately ¾*d.* per bath. The caravan provides accommodation for two men, while at one end are drying closets and at the other disinfecting chambers. The bathing-tents or huts are formed of canvas sheeting attached to the edge of the caravan roof on the one side and to light poles on the other, the sides being also covered in with canvas.

BATH MILITARY HOSPITAL.—Accommodation is being provided at the Bath Military Hospital for 500 additional patients.

MILITARY HOSPITAL FOR CORNWALL.—The beautiful house and grounds of Tregenna, Camborne, are being fitted up as an auxiliary military hospital. Accommodation will be provided for 50 beds.

AMERICAN WOMEN'S HOSPITAL FOR OFFICERS.—This hospital, which owes its origin to the American Women's War Relief Fund, was opened on Wednesday, at 98 and 99, Lancaster-gate, London, by the United States Ambassador. The hospital provides 45 beds under a resident medical officer, Dr. R. H. Browne-Carthew. The same fund has provided the War Hospital of 250 beds at Paignton, Devon.

A HOSPITAL EXTENSION AT HOVE.—An addition has been made to the already numerous military hospitals and Red Cross institutions at Hove by the opening in Palmeira-square of an institution for the treatment of paralysed and nerve-affected soldiers. The new hospital is really an extension of the neurological department of the 2nd Eastern General Hospital. It is well fitted up for the reception of 25 patients, and has been called after the founder, Lady George Nevill.

TRAINING OF DISABLED SOLDIERS.—Replying to questions in the House of Commons on March 19th, Sir A. Boscawen, Parliamentary Secretary to the Pensions Ministry, stated that every endeavour was being made to put the treatment and training of disabled men on a systematic basis in every part of the Kingdom. A joint committee had already been formed in Lancashire for the purpose of pooling facilities, and a similar committee was just being set up in Yorkshire. If proper institutions were not available the Ministry would not shrink from founding new ones. He laid special emphasis on the proposal, constituting a new principle, that pensions would not be reduced as earning capacity increased.

Medical News.

UNIVERSITY OF LIVERPOOL.—At examinations held recently the following candidates were successful:—

M.B., Ch.B.—Second Examination, Part B: Mary H. Wild. Final Examination, Part I.: L. Farris, P. E. Gorst, G. R. James (distinction in Pathology), and V. E. Jones. Part II.: W. M. Jones (distinction in Forensic Medicine and Toxicology and Public Health), and F. A. Prosser. Part III.: E. S. Stubbs (first-class honours and distinction in Obstetric Surgery), I. J. Lipkin (second-class honours and distinction in Obstetrics), P. B. Pinkerton (second-class honours and distinction in Obstetrics), M. Azer, Constance M. Edwards, A. J. B. Griffin, Ruby E. McBirnie, R. Nixon, C. V. Pearson, and R. C. Watts.

Licentiateship in Dental Surgery.—Second Examination, Part I.: I. W. Brown, C. L. Wade, and H. G. Watkin. Part II.: C. L. Wade, H. G. Watkin, and E. H. Williams. Third Examination, Part I.: E. W. H. Owen, F. J. Parle, and E. O. Roberts. Part II.: H. Brown, R. B. Ginsberg, and F. Lockwood. Final Examination: A. Hesselberg and P. Moses.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At the recent Dental Examinations just concluded the following candidates passed the First Dental Examination:—

Andrew John Molyneaux and Egbert John Charle Steyn.

The following passed in the subject of Chemistry and Physics:—

Donald Skinner and George Izett Alexander.

The following passed the Final Examination and were granted the diploma L.D.S., R.C.S. Edin.:—

Petrus Jacobus Hugo le Roux, South Africa; William Graham Bowie, Edinburgh; Leonard Walter Blazey, London; Ulrich Oscar Gottlieb Reinecke, Orange Free State; John McCurdy, Co. Antrim; and Meindert de Villiers, South Africa.

ROYAL MEDICAL BENEVOLENT FUND.—The annual general meeting of the supporters of the Fund took place on March 13th, at 11, Chandos-street, W., Mr. J. H. Morgan being in the chair. It was announced that Sir John Tweedy had resigned the Presidency, which he had held for 10 years, during which had occurred both the incorporation of the Fund and the establishment of the Guild. The thanks of the Fund were given to him for his services, and Dr. Samuel West was elected President in his place, after a service of 22 years as honorary treasurer. To Dr. West the Fund is indebted for the introduction of the present system of accounts, while during his office the output in charity has doubled, the invested property has risen from £52,000 in 1896 to over £102,000, and the number of annuities has risen from 108 to 161. Colonel Charters J. Symonds was appointed treasurer and Dr. G. Newton Pitt re-elected honorary secretary; and the following new members were added to the committee: Dr. J. Fawcett, Dr. Leonard Guthrie, Dr. W. S. Colman, and Mr. Guy Elliston. Cordial thanks were passed to the honorary auditors, Messrs. Deloitte, Plender, and Griffiths, and to the Press, and especially to the editors of the *British Medical Journal* and THE LANCET and to Mr. Guy Elliston of the British Medical Association. The annual report showed that the total subscriptions and donations amounted to £2067, a decrease of £176 compared with last year. The amount distributed in relief was £2503, the excess being made up out of the reserves. The annuity department expended £3119, £91 more than last year, and the number of annuitants was increased by 12. The usual Christmas gift of £1 was sent to each annuitant, and a similar gift to the most deserving grantees, the two grants amounting to £270. The chief event of the year was the War Emergency Appeal, the object of which was to assist medical men, on their return from the war, to recover their position which had suffered by their absence. About £4000 were received, but this is far less than will be required for the object in view, and the public as well as the profession is strongly urged to support this Fund, which is the only one of its kind for the medical profession. £6100 had been invested in the War Loans, part being by the transfer of investments, but £2100 was new money. The annual report of the Guild was ordered to be published with that of the Fund.

At the meeting of the Committee held the same day 20 cases were considered, and £277 4*s*. voted to 17 of the applicants. The following is a summary of some of the cases relieved:—

Widow, aged 49, of L.R.C.P. Irel. who practised at Great Yarmouth and died in 1915. Was left practically without means, and owing to ill-health is unable to earn a living. At present staying with friends, who cannot continue to help her permanently. Voted £6 in six instalments.—Widow, aged 29, of M.B. Lond. who was a Medical Missionary in China and died in June, 1916. Applicant left with two children, ages 2 and 4, and only £35 per annum. Another charity has promised £20 per annum. Applicant wants some help to provide training for herself, so that she will be able to earn a living. Voted £2, and referred to the Guild.—Daughter, aged 50, of M.D. Dub. who practised at Cambridge and died in 1904. Applicant was a teacher in a boarding school, and in 1913 took over the school, but the venture has not been a success, owing mainly to bad health and bad eyesight, which is gradually getting worse, having lost the sight of one eye. Is now in great financial difficulty. Voted £10.—Widow, aged 62, of L.R.C.P. Edin. who practised at Wigan and died in 1913. Endeavours to make a living by letting rooms in the summer, but last year was not successful. Only son joined the Army and the allowance of 9*s*. 3*d*. per week is all she has to definitely depend upon. There are a few book debts still owing from her husband's practice, but these are almost all collected now. Wants help towards her rent. Voted £10.—Wife, aged 38, of M.R.C.S. Eng. who practised at Bournemouth, but is now in an asylum. Applicant has no means and is suffering from advanced tuberculosis. Her three children are provided for at present. She has a little help from other charities, but not sufficient to meet her requirements. Relieved twice, £37 10*s*. Voted £18 in 12 instalments.—Widow, aged 68, of M.B. Edin. who practised at Bolton and died in 1905. Only certain income £9 5*s*. The bulk of her money was lost through a defaulting trustee. Has three children, two married and unable to help, and one son who lives at home, but only earns £1 per week. Relieved once, £12. Voted £12 in 12 instalments.—Daughter, aged 56, of M.R.C.S. Eng. who practised at Manchester and died in 1898. Owing to ill-health applicant has had to give up her work as a clerk. Only income a pension from her late employers of 6*s*. per week. Relieved twice, £26. Voted £15 in 12 instalments.—Wife, aged 51, of L.R.C.P. Irel. who practised at Chatham, and left his wife some years ago, with three children to bring up. The children are now getting on well, the eldest daughter having recently taken a situation, but not able to help much, as she is away from home. The eldest son is in the Army and the youngest at Epsom College. Applicant unable to work owing to eye trouble. Relieved four times, £38, and helped by the Guild. Voted £12 in 12 instalments.—Daughter, aged 53, of M.R.C.S. Eng. who practised in London, and died in 1895. Applicant's health is very indifferent, and although she has tried various kinds of employment her health will not permit her to continue. At present staying at a home of rest. Relieved five times, £83. Voted £12 in 12 instalments.—Widow, aged 62, of L.R.C.P. Edin. who practised at Dumfries, and died in 1909. Applicant was left with four children, two of whom are now in the Army, and the youngest daughter only earning 23*s*. a week and not living at home. Applicant unable to work owing to ill-health. Relieved eight times, £80. Voted £12 in 12 instalments.—L.R.C.P. Lond. and L.S.A. Lond., aged 89 (married, his wife 83), who practised at Wandsworth. Owing to age not able to do much work. Some years ago lost practically all his practice through the removal of a large railway works from near his house, and from which most of his practice came. This, with the coming of the National Insurance Act, ruined his practice. In great financial difficulties. Relieved once, in 1913, £12. Voted £26 in 12 instalments.—Widow, aged 48, of M.B. Edin. who practised at Glasgow and died in 1912. Applicant was left totally unprovided for, with seven children. The two eldest are now married, two others are in the Army, one daughter a clerk earning 10*s*. per week, and the others are at school. Income from other charities £22, and from children £41 12*s*. Relieved five times, £92. Voted £20 in 12 instalments.—Daughter, aged 50, of M.D. Glasg. who practised at Rawtry and died in 1872. Applicant lives in own house. Endeavours to make a living by taking in paying guests, but as

she lives on the East Coast has not been successful since the war commenced. Relieved twice, £20. Voted £10 in two instalments.—Widow, aged 53, of M.B. Aberd. who practised at Belfast and Dublin and died in 1913. Was left unprovided for with four children. The eldest son was in his second year as a medical student when the war broke out and had to join the Army. He has been wounded and is now invalided out of the service and is continuing his medical studies. The other children only earning very little. Relieved once, £5. Voted £15 from the War Emergency Fund.—Widow, aged 63, of L.R.C.P. Irel. who practised in London and died in 1916. Her husband was for some years a pensioner of the Fund and the applicant was left quite unprovided for and makes a living by letting rooms. Relieved twice, £14. Voted £15 in 12 instalments.—Widow, aged 59, of M.D. Edin. who practised in Cumberland and died in 1903. Endeavours to make a living by taking in boarders, but does not get sufficient. Has four children, all married and unable to help. Relieved ten times, £120. Voted £15 in 12 instalments.

Subscriptions may be sent to Dr. Samuel West at 11, Chandos-street, Cavendish-square, London, W., who will act temporarily as honorary treasurer during the absence on duty of Colonel Charters Symonds.

RED CROSS PHYSICAL CLINIC.—At the Red Cross Physical Clinic for Wounded and Disabled Officers (126, Great Portland-st., W. 1) on Thursday and Friday next, March 29th and 30th, a short account of the methods of treatment and of the measuring instruments employed in testing functional efficiency will be given on both days at 4 P.M. Admission will be free to members of the medical profession.

ROYAL ABERDEEN HOSPITAL FOR SICK CHILDREN.—The fortieth annual report of this hospital shows a total of 1871 cases treated during the year, 759 as in-patients and 1112 as out-patients. Of these 759 in-patients 590 were discharged as cured, 50 died, and 3 improved. The work of the hospital has again been carried out at Kepplestone. The open-air ward, accommodating 26 cases, opened in May, 1916, has proved an unqualified success. The gross ordinary expenditure has exceeded the ordinary income for the year by £338.

CENTRAL MIDWIVES BOARD.—Special meetings of the Central Midwives Board were held at Queen Anne's Gate Buildings, Westminster, on March 13th and 14th, with Sir Francis H. Champneys in the chair. A number of midwives were struck off the Roll, the following charges, amongst others, having been brought forward:—

That being in attendance as a midwife at a confinement and having explained that the case was one in which the advice of a registered medical practitioner was required, the midwife did not hand to the husband or the nearest relative or friend present the form of sending for medical help properly filled up and signed by her, in order that this might be immediately forwarded to the medical practitioner, as required by Rule E. 20, and the advice of a registered medical practitioner having been sought, she neglected to notify the Local Supervising Authority thereof, as required by Rule E. 22 (1) (a). The midwife neglecting to take and record the pulse and temperature of the patient at each visit, as required by Rule E. 14, and neglecting to enter true records of the patient's pulse and temperature in a note-book or on a chart carefully preserved, as required by Rule E. 14. A patient suffering from serious rupture of the perineum, the midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E. 21 (3). The midwife not being scrupulously clean in every way, including her person, clothing, appliances, and house, as required by Rule E. 2, and she did not on each occasion when attending her patients wear a clean dress of washable material, as required by Rule E. 2, and was guilty of misconduct in recording pulses and temperature purporting to be those of patients whom she had attended, when in fact she had taken no such pulses and temperatures. Being in attendance at a confinement the midwife did not on each occasion disinfect her hands and forearms before touching the patient's generative organs or their neighbourhood, as required by Rule E. 4; she neglected to make use of the antiseptic precautions for washing the patient's external parts and swabbing them with an efficient antiseptic solution, as required by Rule E. 8 (a). A child suffering on the third day from inflammation of and discharge from the eyes, the midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E. 21 (5). A midwife having been convicted on an indictment alleging that being a person over the age of 16 years having the custody of a child, she neglected the child in a manner likely to cause injury to its health, and had been sentenced to six months' imprisonment. A midwife having been convicted and sentenced to 12 months' hard labour for that she did unlawfully kill a woman.

THE HEALTH OF MUNITION WORKERS.—At the Royal Institute of Public Health on March 14th Mr. Edgar L. Collis, Medical Inspector of Factories, outlined the problems of modern industrial hygiene as presented to the Health of Munition Workers' Committee. The work of this committee has been based on the following principles: (1) Proper alternation of rest and work; (2) the supply of sufficient and nourishing food on which the efficiency of the worker largely depends; (3) the provision of proper lighting, temperature, fresh air, and protection against disease; (4) the fact that the physical organisation of woman, though weaker than that of man, is more suited to continued effort; (5) the necessity of providing human beings during immaturity with shorter periods of activity and longer periods of rest than are required by adults. After referring to the good work done by Welfare Supervision Committees (*vide* THE LANCET, Jan. 6th, p. 25), the lecturer concluded by stating that many of these problems under consideration, whether concerning the employment of men, women, or children, have only recently been grappled with, and it was amazing that the present stage of industrial progress should have been reached without any serious attempt to solve them. Had the attempt been made earlier much of the bitter heritage of labour unrest which had descended to us might have been spared. He expressed the hope that, with the new insight which the war had brought us, a better understanding might prevail, and the welfare of the industrial population, upon which the prosperity of the Empire depended, be safeguarded to the utmost of our power.

A Royal Humane Society Certificate on vellum was presented to Dr. T. F. Ryan at Edmonton Military Hospital on March 10th for attempting the rescue of a lad who was drowned in a pond at Edmonton on Jan. 28th.

BANFF INSURANCE COMMITTEE.—At a meeting of the Banff Insurance Committee, held on March 10th, it was intimated that the Committee had decided not to allow the doctors to prescribe patent medicines, but only to allow prescriptions for medicines appearing in the P.B. and the B.P.C. lists. Doctors would be allowed to make "repeats" only on prescriptions which had been dispensed within the calendar month in which the prescription was dispensed.

ROYAL DEVON AND EXETER HOSPITAL, EXETER.—The annual meeting of the friends of this charity was recently held under the presidency of Sir E. Channing Wills. The medical report stated that the in-patients numbered 2185, an increase of 65 on the previous year, and a record for the hospital. The average daily number of occupied beds was 172. The financial statement was satisfactory and showed a total income of £15,207 compared with £12,360 in 1915.

THE LATE DR. HENRY COLPOYS TWEEDY.—Dr. Henry Colpoys Tweedy, who died last week at Clifton, Bristol, had passed his active professional life in Dublin. He graduated M.B. of Dublin in 1871, and was elected a Fellow of the Royal College of Physicians of Ireland in 1889. He was for many years visiting physician to Dr. Steevens' Hospital. Some 15 years ago his sight failed, and he was compelled to retire from practice, since when he has lived in the south of England.

DONATIONS AND BEQUESTS.—The late Dame Hester Mary Stewart has bequeathed by will £1000 each to the Zenana Bible and Medical Mission, the London Fever Hospital, Dr. Barnardo's Homes, the Royal Infirmary, Perth, and the Royal Infirmary, Edinburgh.—By will the late Mrs. Edith Harriet Scott left £1000 to St. George's Hospital. The residue of the estate, after providing legacies to other charities, is left in equal shares to Guy's Hospital, St. George's Hospital, and the Hospital for Diseases of the Heart, Soho-square.—The late Mr. Peter Reid has, among other bequests, left £20,000 to the Hospital for Sick Children, Great Ormond-street, for erecting and helping to maintain a convalescent home for the patients; and £500 each to the Hospital for Consumption and Diseases of the Chest, the London Hospital, the Metropolitan Convalescent Institution, St. Mary's Hospital, Paddington, St. Thomas's Hospital.—By will the late Captain Edward Vivian Dearman Birchall, D.S.O., has left £2000 to the chairman of the Buckinghamshire Territorial Association for the benefit of the wounded men of the 1st Bucks Battalion and for the widows and dependents of those killed in the war; and among other bequests £100 each to Gloucester Infirmary and Leeds Infirmary.—Miss Mary Grace Child has left by will £2000 to the London Hospital.—By will the late Mr. John Leigh has bequeathed £1000 to the Oldham Infirmary.

ROYAL SUSSEX COUNTY HOSPITAL.—The Royal Sussex County Hospital at Brighton has suffered financially from the war conditions and showed at the end of 1916 an adverse balance of over £2700. During the year 784 military cases were treated, a daily average of 60 beds being occupied by soldiers. The number of female in-patients exceeded by 73 those treated in 1913, which previously held the record of 1226 cases. The cost per bed rose last year to the unprecedented figure of £93 6*s.* 6*d.*, while the financial support given by the public showed a considerable falling off. The deficiency in the year's working (£2703) has been met by a call upon the available fund, which is now practically exhausted. It had, by some at any rate, been anticipated, inasmuch as many suggestions had been thrown out for the establishment of pay-wards with a view of easing the burden of maintenance. But there are legal difficulties in the way, and at the annual court of governors the chairman of the board of management, in reviewing the financial position, pointed out that should the position necessitate the closing of the wards for a period they might possibly be opened as pay-wards. Lord Hythe, the new President, urged that the needs of the hospital should be brought home to the local branch of the League of Mercy with a view of securing aid from the King Edward's Hospital Fund.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Venereal Disease Bill.

THE Venereal Disease Bill has been read a third time by the House of Lords. It is now under the consideration of the House of Commons.

Criminal Law Amendment Bill.

Further progress has been made in the Standing Committee of the House of Commons with the detailed consideration of the Criminal Law Amendment Bill. On Thursday, March 15th, the principal matter of discussion was the age of consent on the part of girls. An amendment was proposed to raise it from 16 to 17 years of age, and it received considerable support. Sir GEORGE CAVE, the Home Secretary, however, declined to accept the proposal, because on the experience of the past he feared that it would lead juries to acquit men who were charged with the offence on the ground that they had reasonable cause to believe that the girl was above the age. The amendment was rejected by 21 votes to 20. Clause 3 of the Bill, however, provides that reasonable cause to believe that the girl was of or above the age of 16 shall not in future be a defence to a charge under the principal Act.

On Tuesday, March 20th, the Committee was engaged in considering penal provisions in the Bill in regard to brothel-keepers and solicitation.

Disabled Soldiers.

The House of Commons on Monday, March 19th, rediscussed the provisions for disabled soldiers under the proposed Royal Warrant. Mr. BARNES, the Minister of Pensions, announced some minor changes in its terms.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 14TH.

Prisoners of War in Turkey.

Answering Mr. HUME-WILLIAMS, Mr. JAMES HOPE (representing the War Prisoners Department) said: The Turkish Government persist in their refusal to allow prisoners of war camps to be visited by representatives of the American Embassy. Seven of the camps were, however, visited in November by delegates of the International Red Cross Society—namely, those at Eski Shehir, Aifon Kara Hissar, Ismidt, Broussa, Konia, Kirshehir, and Yozgad, besides two hospitals at Constantinople and the Island of Prinkipo, where General Townshend is interned. The British prisoners at the camps visited numbered 182 European and 211 Indian officers and 658 European and 417 Indian non-commissioned officers and men. From the information obtained through the Red Cross delegates it appears that although the condition of the officers is on the whole not unsatisfactory, that of the rank and file leaves much to be desired and gives cause for much anxiety. There remained unvisited 14 camps and 3 hospitals containing, according to figures furnished by the Turkish authorities, 131 European officers and 1086 European and 8115 Indian non-commissioned officers and men. The information available respecting the camps unvisited is scanty and in general unsatisfactory, but has recently been somewhat more reassuring, at least as regards the transmission of the relief in money and kind which is continuously being issued by the United States Embassy, and for which H.M. Government are profoundly grateful.

Medical Resources of India in the War.

Mr. CHAMBERLAIN (Secretary for India) in the course of his remarks dealing with India's contribution to the war said: The House will not blame me if I spend a moment over the medical services. The medical arrangements of the Indian authorities, whether at home or abroad, have come under severe criticism, and this is not the occasion for me to offer any justification or any defence, but I want to tell the House in a few words what the Government of India did from the narrow resources, for after all they are very narrow resources, at their disposal. Forty field ambulances, 6 clearing hospitals, 35 stationary hospitals, 18 general hospitals, 9 X ray sections, 8 sanitary sections, 7 advanced depôts, and 1 general medical store depôt have been sent on service over-seas. The personnel provided for these units and other services amounts to 258 officers of the Royal Army Medical Corps, 704 officers of the Indian Medical Service, 40 lady nurses, 475 assistant surgeons, 854 sub-assistant surgeons, 720 British nursing orderlies, 2840 Indian ranks, and nearly 20,000 Indian followers. In order to meet the heavy demands on the Indian Medical Service nearly 350 officers have been withdrawn from civilian employment, and some 200 private practitioners and civil assistant surgeons have been given temporary commissions. In the subordinate branches 205 assistant surgeons and 560 sub-assistant surgeons in various kinds of civil employment have been released for military duty. May I say at once, whilst abstaining from any plea in defence of either the Secretary of State for India or the Government of India, in connexion with the military arrangements, that, as far as I know, all the testimony from everyone who has had experience concurs in this, that the devotion and self-sacrifice of the officers of the Medical Services attached to the Expeditionary Forces have not been exceeded, and could not be exceeded, in this war. The House knows that this is not the last word of the Government of India on the subject.

THURSDAY, MARCH 15TH.

State Registration of Nurses.

Major CHAPPLE asked the Parliamentary Secretary to the Local Government Board whether, in view of the fact that all the great associations representing the nursing profession in the United Kingdom, including the British Medical Association, the Royal British Nurses' Association, the Matrons' Council of Great Britain and Ireland, the Society for the State Registration of Trained Nurses, the Fever Nurses' Association, the Association for Promoting the Registration of Nurses in Scotland, the Scottish Nurses' Association, the Irish Nurses' Association, the National Union of Trained Nurses, and the College of Nursing, Limited, have now announced officially their unqualified support of State registration, he would bring in a Bill to effect this purpose.—Mr. HAYES FISHER answered: I am aware that the bodies named have expressed opinions in favour of the State registration of nurses, but the information before me does not show that they are in agreement as to the character of the scheme. I cannot at present give any promise of legislation on the subject.

A Case of Agoraphobia.

Sir J. D. REES asked the Under Secretary for War whether agoraphobia was included among the diseases which disqualified persons otherwise qualified to serve in the Army; and, if so, how many agoraphobists had been granted exemption by medical boards since the war began.—Mr. MACPHERSON replied: In only one case, as far as is known, has this disease disqualified a man for service, and the man in question was otherwise of unsound mind, though not certifiable.

Medical Examination of Recruits.

Mr. GLANVILLE asked the Under Secretary for War whether he would consider the possibility of giving such a thorough medical examination to recruits as would prevent men passed for active service and similar categories taking up the time and attention of the military authorities for months until their shortcomings caused them to be relegated to C 3 category to which they should have been originally passed.—Mr. MACPHERSON wrote in reply: The whole question receives the constant and careful consideration of the War Office. The number of men, however, where the original classification has been revised is an infinitesimal proportion of the total, and considerably more men are raised in the category every month than lowered. My honourable friend appears to make a reflection upon the capacity of those members of the medical profession who are doing their work under great pressure, and I cannot let it pass without a strong protest. Considering the vast total of medical classifications carried out every day, the total number of mistakes made is surprisingly small.

TUESDAY, MARCH 20TH.

Medical Men in Ireland and Military Service.

Colonel MCCALMONT asked the Under Secretary for War whether it was in accordance with the decision of the Army Council that a civilian doctor in Ireland appointed in medical charge of troops in his locality before the war, who although of military age had been found medically unfit for general service by a board, was to be forthwith replaced by another local civilian doctor of over military age; if so, upon what grounds had it been decided to penalise young unfit doctors; and whether this decision would apply to doctors who had become unfit through military service.—Mr. MACPHERSON replied: It is in accordance with the wishes of the Central Medical War Committee that we should not employ young doctors at home, as this prevents others from volunteering. Young medical men who are unfit are employed on general service at home and not locally.

THE Raymond Horton Smith prize, awarded by the University of Cambridge to that candidate for the degree of M.D. who presents the best thesis for the degree during the academical year, provided that he has taken honours in a tripos examination, has been won by Mr. Ff. Roberts, B.C., M.D., designate of Clare. The subject of the thesis was "Degeneration of Muscle following Nerve Injury."

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BARSTOW, Dr. IRENE, has been appointed Assistant Medical Officer of Health (*pro tem.*) for Sheffield.

COOPER, H. G., M.B., B.C.Cantab., Certifying Surgeon under the Factory and Workshop Acts for the Altrincham district of the county of Chester.

DICKSON, Dr. MARGARET SCOTT, Medical Officer of Dundee's New Maternity and Child Welfare Scheme.

HILLIARD, H., M.R.C.S., L.R.C.P., D.P.H., Anæsthetist to Charing Cross Hospital.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BIRMINGHAM CITY EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary £300 per annum.

BIRMINGHAM GENERAL DISPENSARY.—Resident Medical Officer, unmarried. Salary £250 per annum, with apartments, &c.

BIRMINGHAM AND MIDLAND EYE HOSPITAL.—Female House Surgeon. Salary £200 per annum.

BLACKPOOL, VICTORIA HOSPITAL.—House Surgeon. Salary £250 per annum, with board, &c.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Female House Surgeon. Salary £150 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, &c.

DEVONPORT, ROYAL ALBERT HOSPITAL.—Assistant House Surgeon, unmarried. Salary £150 per annum, with board, &c.

EAST RIDING LUNATIC ASYLUM, Beverley.—Temporary Female Assistant Medical Officer. Salary at rate of £250 per annum, with board, &c.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark, S.E.—Clinical Assistants in Out-patient Departments.

GLAMORGAN COUNTY ASYLUM, Bridgend.—Temporary Assistant Medical Officer. Salary £6 6s. per week, with board, &c.

GRIMSBY COUNTY BOROUGH.—Temporary Female Assistant Medical Officer. Salary £350 per annum.

GUILDFORD, ROYAL SURREY COUNTY HOSPITAL.—House Surgeon. Salary £250 per annum, with board, &c.

IPSWICH, EAST SUFFOLK AND IPSWICH HOSPITAL.—Female Resident Officer.

KENSINGTON AND FULHAM GENERAL HOSPITAL, Earl's Court, S.W.—Resident Medical Officer. Salary £150 per annum.

LEEDS PUBLIC DISPENSARY.—Second Female Resident Medical Officer. Salary £200 per annum, with board, &c.

LIVERPOOL, DAVID LEWIS NORTHERN HOSPITAL.—House Surgeon for six months. Salary at the rate of £150 per annum, with board, &c.

LIVERPOOL, ROYAL SOUTHERN HOSPITAL.—Two House Surgeons for six months.

MANCHESTER, BAGULEY SANATORIUM FOR TUBERCULOSIS.—First Assistant Medical Officer, unmarried. Salary £300 per annum, with board, &c.

MANCHESTER CORPORATION.—Assistant Tuberculosis Officer. Salary £350 per annum.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—House Surgeon. Salary £150 per annum, with board, &c.

METROPOLITAN HOSPITAL, Kingsland-road, E.—Temporary Medical Officer for the Tuberculosis Dispensary.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford.—House Surgeon.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician and Casualty House Surgeon for six months. Salary £120 per annum, with board, &c. Also Temporary Anæsthetist.

ROTHERHAM HOSPITAL.—Junior House Surgeon. Salary £150 per annum, with board, &c.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Two House Physicians and Two House Surgeons. Salary £50 per annum, with board, &c. Also Junior Obstetric Assistant. Salary £62 per annum, with board, &c.; also care of 16 beds at Endsleigh Maternity Hospital. Salary given. Also Assistant Anæsthetist. Salary £93 per annum. Also Female Senior Obstetric Assistant. Salary £93 per annum, with board, &c. Also to attend at Endsleigh-street Maternity Hospital. Salary £60 per annum.

ROYAL WATERLOO HOSPITAL FOR CHILDREN AND WOMEN, S.E.—Temporary Honorary Assistant Physician.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SOUTHAMPTON, ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL.—House Physician and Junior House Surgeon. Salaries £150 and £120 per annum respectively, with board, &c.

ST. BARTHOLOMEW'S HOSPITAL.—Assistant Ophthalmic Surgeon.

ST. PETER'S HOSPITAL, Henrietta-street, Covent Garden, W.C.—Junior Anæsthetist.

TRURO, ROYAL CORNWALL INFIRMARY.—House Surgeon. Salary £150 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Atherstone (Warwick) and Minehead (Somerset).

Births, Marriages, and Deaths.

BIRTHS.

BOOTH.—On March 19th, at "Wyngarth," Breck Hill-road, Mapperley Plains, Notts, the wife of Captain N. Booth, M.B., B.S.Lond., R.A.M.C., of a daughter.

BUSHE.—On March 17th, at Tolleshunt Knights Rectory, Witham, Essex, the wife of Staff Surgeon Charles Kendal Bushe, M.D., R.N., of a daughter, who survived her birth only a few hours.

GROGONO.—On March 20th, at 129, Camberwell-road, S.E., to the wife (*née* Florence Muriel Steele) of Jonathan Grogono, M.R.C.S., L.R.C.P.—a daughter.

TAYLOR.—On March 12th, at the Vicarage, Walton-le-Dale, Lancs., the wife of Leonard H. Taylor, Lieutenant, R.A.M.C., of a son.

MARRIAGES.

BAZETT—LIVESEY.—On March 10th, at St. Andrew's Church, Oxford, Henry Cuthbert Bazett, Captain, R.A.M.C., to Dorothy Livesey, daughter of the late T. J. Livesey and Mrs. Livesey, of Pueblo, Colorado.

CALTHROP—CHANCE.—On March 14th, at St. Barnabas' Church, Kensington, Edward Spencer Calthrop, R.N., M.B., B.S., to Eleanor Mary, only daughter of Mr. F. W. Chance, of Morton, Carlisle.

FRY—BECKER.—On March 14th, at St. Paul's Church, Tottenham, Captain Augustin P. Fry, R.A.M.C., to Elsie Blanche, eldest daughter of Mr. G. Becker and Mrs. Becker, Tottenham, N.

SMITH—USSHER.—On March 12th, at Holy Cross Church, Lichfield, Vincent Smith, Lieutenant, R.A.M.C., to Hope, daughter of the late Major Ussher, 7th Dragoon Guards, and Mrs. Ussher, Rathdown Cottage, Greystones, Co. Wicklow.

DEATHS.

BLOMFIELD.—On March 18th, at The Grove, Robertsbridge, Sussex, Dr. Samuel Bartlett Blomfield, aged 47.

GIBBINS.—On March 17th, at Holmdale, Parkstone, Kenneth Mayoh Gibbins, M.B. Lond.

HAMMOND.—On March 15th, died of wounds, John Maximilian Hammond, M.B., B.S., Lieut., R.A.M.C., aged 41.

HEARD.—On March 15th, at Bradford, the result of a stroke while serving as Lieut., R.A.M.C., Francis George Heard, L.R.C.P., L.R.C.S. Edin., aged 53.

MILLER.—On March 11th, killed in action, Archibald Ingram Miller, M.B., Ch.B. Edin., Lieut., R.A.M.C., aged 34.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN, London.

The American League to Enforce Peace. By C. R. Ashbee. With an Introduction by G. Lowes Dickinson. 2*s.* 6*d.* net.

Professionalism and Originality. With Some Suggestions for National Reconstruction. By F. H. Hayward, D.Litt., B.Sc., Inspector of Schools. 6*s.* net.

CAMBRIDGE UNIVERSITY PRESS.

Science and the Nation. Essays by Cambridge Graduates, with an Introduction by the Right Hon. Lord Moulton, K.C.B., F.R.S. Edited by A. C. Seward, F.R.S., Master of Downing College, Cambridge. 6*s.* net.

Psychology of Sound. By H. J. Watt, M.A., Ph.D., D.Phil. 10*s.* 6*d.* net.

Domestic Economy for Teachers and Students. Part 1, Theory, by Marion G. Greenwood. Part 2, Practice and Teaching, by Florence Baddeley. Each 2*s.* 3*d.* net.

CHAPMAN AND HALL, London.

Bird of Life. By Gertrude E. M. Vaughan. 5*s.* net.

CHURCHILL, J. AND A., London.

St. Thomas's Hospital Reports. New Series. Edited by Dr. J. J. Perkins and Mr. C. A. Ballance. Vol. XLIII. 8*s.* 6*d.* net.

CONSTABLE AND CO., London.

Letters from a French Hospital. 2*s.* net.

FOSTER GROOM, 15, Charing Cross-road.

How to Take Care of Your Teeth. With a chapter on the Feet by H. E. Sykes Brown, M.I.H. Foreword by J. Sim Wallace, D.Sc., M.D., L.D.S. 1*s.* net.

HEINEMANN, WILLIAM, London.

Treatment of Tabetic Ataxia by Means of Sytematic Exercise. By Dr. H. S. Frenkel. Second English edition, by L. Freyberger, J.P., M.D. Vienna, Barrister-at-Law. 12*s.* 6*d.* net.

IMPRIMERIE NATIONALE, Paris.

Commentaires de la Faculté de Medécine de l'Université de Paris (1395–1516). Publiés avec un introduction et des notes par le Dr. Ernest Wickersheimer, bibliothécaire de l'Académie de Médecine.

LIVINGSTONE, E. AND S., Edinburgh.

Catechism Series, 1*s.* 3*d.* each. Surgery, Parts 1 and 2, third edition. Materia Medica, Parts 1 and 2, second edition. Physiology, Part 1, third edition. Pathology, Part 1, second edition.

MACMILLAN AND CO., London.

Organic to Human, Psychological and Sociological. By Henry Maudsley, M.D. 12*s.* net.

Notes, Short Comments, and Answers to Correspondents.

CURIOSITIES OF WAR

THERE is no doubt that at the conclusion of the present war there will be many who have taken part in various ways who could furnish instances of the curiosities of war, which, if collected together, would make a large volume. In the year 1860, Thomas Carter, of the Adjutant-General's office, published a book of just over 400 pages, which was dedicated, with permission, to H.R.H. the Duke of Cambridge, and entitled, "Curiosities of War and Military Studies, Anecdotal, Descriptive, and Statistical." Some of the contents were new and some old. Of the old, we give the following example, which is of interest to the medical profession:—

Singular Description of a Deserter from the Twenty-Second Regiment of Foot.—(From the *London Gazette*, of July, 1683.)—Ran away out of Captain Soames' company, in his Grace the Duke of Norfolk's regiment of infantry, quartered at Newport, in Shropshire, Roger Curtis, a barber-surgeon, a little man, with short black hair, a little curled; round visage, fresh-coloured, in a light-coloured cloth coat, with gold and silver buttons, and the loops stitched with gold and silver, red plush breeches, and white hat; he lived formerly at Downham Market, in Norfolk. Whoever will give notice to Francis Baker, the agent to the said regiment, in Hatton Garden, so that he may be secured, shall have two guineas reward

The following paragraph in the book is also interesting, though its information is probably familiar to many of our readers:—

Supposed origin of sashes.—Sashes are believed to have been invented for the ease of wounded officers, by means of which (in case any of them were so badly wounded as to render them incapable of remaining at their posts) they might be carried off with the assistance of two men. They are now reduced to a very small size, and, of course, unfit for the original purpose.

Woman in Battle is the title of one section of the book. Here is related the life and adventures of Mrs. Christian Davies, the British Amazon, commonly called Mother Ross, who served as a foot soldier and dragoon in several campaigns under King William and the great Duke of Marlborough, and was eventually made a pensioner of Chelsea College by Queen Anne, dying on July 7th, 1739. The story is told also of Phœbe Hessel, born in Stepney in 1713, who served for many years as a private soldier in the 5th Regiment of Foot in different parts of Europe, and in the year 1745 fought under the command of the Duke of Cumberland at the battle of Fontenoy, where she received a bayonet wound in her arm. King George IV. allowed this aged veteran a pension of half a guinea a week, which she enjoyed for many years, dying at Brighton, where she long resided, on Dec. 12th, 1821, aged 108. There is a section of military epitaphs, and in it we find one to the memory of Thomas Thatcher, in the 2nd Regiment of the Hants Militia, who "died of a violent fever, contracted by drinking cold small Beer when Hot":—

> Here sleeps in peace a British Grenadier,
> Who caught his death by drinking cold small Beer.
> Soldiers be wise from his untimely fall,
> And when ye're hot drink strong or none at all.

MAURITIUS MEDICAL REPORT.

IT appears from the medical section of the Mauritius Blue-book for 1915 that the total population of the island on Dec. 31st of that year, exclusive of the dependencies (7320), was estimated at 375,420, showing a decrease of 813 on the population returns for 1914.

There were 11,893 births registered during the year. The law allows a delay of 45 days for free registration, and the number of births which were not registered owing to death intervening before registration was 1201. The total number of births was accordingly 13,094, of which 6747 were males and 6347 females, giving a proportion of 34·8 infants born to 1000 persons living. The deaths registered numbered 13,101, giving a proportion of 34·8 deaths to 1000 persons living.

The general health conditions during 1915 were not satisfactory. The number of patients treated at public hospitals showed an increase over that recorded in 1914. There was a considerable reduction in the number of patients attending dispensaries, but more out-door patients were treated in hospitals. The diseases that caused the largest number of deaths were malaria (4401), tuberculosis (959), pneumonia (710), and dysentery (636), but it should be observed that a medical certificate is not required in all cases. Only 33 cases of plague were registered during the year, as against 125 in 1914; it was the lowest total hitherto recorded in any year. There was a marked reduction in the number of admissions for enteric fever from 234 in 1914 to 188 in 1915. Malaria still causes more deaths than any other disease. The number of deaths ascribed to fever was 4401, showing an increase of 487 on that recorded in 1914. The case mortality was 1·63 per cent., as against 1·77 per cent. in 1914. Malaria was most prevalent in March, April, and May, after the comparatively heavy rainfalls in February and March. The spleen census and the treatment of school-children with quinine, as well as the free house-to-house distribution of quinine, have been continued. The number of children vaccinated during the year was 10,358.

The mean rainfall from 42 stations was 58·20 inches, as compared with an average of 75·84 inches. The highest temperature was 91·5° on Jan. 28th and the lowest 54·0° on August 22nd.

ST. GEORGE AND THE DRAGON.

ON the new pound notes the figure of St. George and the dragon is worth studying and comparing with some of the early designs on our sovereigns and crown-pieces. The original design of this character was made by Benedetto Pistrucci (1784–1855), a gem engraver and medallist, and there is a legend that Pistrucci's original model was an Italian waiter who used to serve in a restaurant near Leicester-square, London, and that Pistrucci chose him for his fine figure. In 1817 a pattern crown-piece was made by Pistrucci with his design on the reverse but without the artist's name or initials, but on some afterwards he had his name in full, and then later B.P., which can still be seen on our sovereigns and crown-pieces, under the design. Pistrucci's figure portrayed a very muscular body, bent into a curve, the rider's face almost touching the crest of the horse's neck, with the muscular right arm only slightly bent, and grasping a short dagger, for the spear is broken, and a part of the shaft is lying at the hind feet of the horse. Only the left hand holding the reins shows. The right leg is slightly bent, and the foot pushed forward. The figure on the pound note portrays an upright unmuscular body of inverted triangle shape, the right arm holding a spear is bent, and raised so high that the elbow makes an acute angle; and the whole of the left upper arm and hand holding the reins shows. The right leg is bent back, and the limb forms an acute angle. The horse's tail is drawn in instead of out, and the disposition of the forelegs is puzzling.

DECENTRALISED PATRIOTIC EFFORT.

Mr. W. R. Boelter, late editor of the *Smallholder*, is the author of a penny pamphlet on "Parish War Societies: How to Form and Conduct Them" (published by the Smallholders' Union, Ltd., 7, Queen-street-place, London, E.C.), based upon an experiment in village organisation made by him in Wendy, Cambs. Mr. Boelter defines a parish war society as consisting of those members of a parish who know that the war is not to be won by fighting alone, but also by working, saving, and planning, and who have therefore banded themselves together in order to do these things more effectively than they could do them alone. In a parish war society Mr. Boelter finds the sort of flexible organisation which can be grafted upon any kind of war work already in being. The pamphlet describes the way of starting such a parish war society and the directions in which it has developed at Wendy. A welfare subcommittee has been one of these, charged with the duties of organising Red Cross work, of making comforts for the men in the fighting line and prisoners of war, and of arranging for the care of convalescent soldiers and other ex-Service men. This useful and stimulating pamphlet ends by suggesting rules for the running of such a society.

THE RIGHT AND LEFT HANDS.

THE care of the limbs is now a subject of increased importance, and the comparisons between the right and left hand and right and left leg are of interest to many fighters, workers, injured persons, their relatives, the insurance companies, and the State generally. Ambidexterity is a matter to which more attention will probably be paid in the near future. Students of the subject maintain that as many stone "scrapers," "hammers," "pounders," and so forth, which were used without hefts or handles, were made for use by the left hand as for the right, although the right hand came gradually to be preferred for offence and the left for defence, the right hand being termed the "throwing," "great," or "male" hand and the left hand the "female" hand. It is alleged that in Africa there are more ambidextrous men than in Europe. In the Arabian Nights' Entertainments, the Christian merchant who excused himself to his host for feeding with his left hand, explained that for the theft of a purse after spending all his money on a lady the judge had ordered his hand to be cut off and would have cut his foot off, too, but for the intercession of the owner of the purse. Lane's note is: "This law imposing the loss of the hand for a theft of

anything exceeding a quarter of a dinar in value, induced a Mussulman to inquire, 'If the hand is worth 500 dinars (this being the fine for depriving a man of that member) why should it be cut off for a quarter of a dinar?' He was answered, 'An honest hand is of great value, but not so is the hand that hath stolen.'" A dinar (Latin, denarius) was the name of a gold coin issued by the Caliphs of Damascus of about 65 grains troy.

Although the right hand does heavier and finer work than the left it is at the same time probably more alert in taking care of itself; but the right hand is not spared as much as it might be, and often the left hand might be given more work to do in lifting and carrying, thus saving the right hand from the after-effects of muscular strain which is frequently shown in a tremor of the muscles which may last for several hours, and even over the next day, making the complete control of the muscles of the right arm and hand impossible. This is more especially observed perhaps in those sedentary workers who take to hard and unaccustomed manual labour, such as digging and wheeling barrows and chopping wood. The muscles of the arm seem to have a much longer "memory" of any unwonted strain imposed upon them, even when the owner of the limb has forgotten the job which his arm has performed. This is evident when he tries next to handle a pen, for example, or to do some delicate and fine work with the hand.

THE HEREDITARY FACTOR IN PELLAGRA.

AN elaborate study, by Charles B. Davenport, of the Carnegie Station for Experimental Evolution, and Dr. Elizabeth B. Muncey, of the Eugenics Record Office (Bulletin No. 16), leads to the conclusion that the data collected show no evidence of direct heredity. There may, however, be an hereditary predisposition to the disease in those families in which chronic gastro-intestinal symptoms have existed for several generations. The relatively high proportion of gastric and intestinal diseases among pellagrous families seems to substantiate this hypothesis. Of the 105 families in which there is only one case of pellagra, only three gave a history of intestinal or skin diseases in the ancestors, and only one a history of antecedent insanity. The authors conclude that with this predisposition to the disease, direct contact or life in endemic areas might afford the exciting factor necessary for its development.

CEDAR OIL AS AN ADDITION TO AMBRINE.

To the Editor of THE LANCET.

SIR,—May I suggest as an addition to paraffin wax for an "ambrine" preparation the use of cedar oil? Though nominally a "volatile oil," it resinifies rapidly in contact with the air, as every histologist knows, and of course possesses the antiseptic properties of all its class. It would give toughness to the paraffin. I do not know what its present price may be; but as the product of the distillation of a waste product—chip shavings and sawdust of pencil cedar—(*Juniperus americana* and *J. bermudiana*)—it has always been among the cheapest of essential oils.

I am, Sir, yours faithfully,
MARCUS HARTOG, M.A., D.Sc., &c.

University College, Cork, March 13th, 1917.

HERB-COLLECTING.

THE Gardening Association, which is under the patronage of Princess Louise, Duchess of Argyll, has issued a second edition of a useful booklet, "Herb-Collecting for Boys and Girls," by Mrs. T. Chamberlain and Miss E. C. Wheelwright. In it are given instructions as to the finding of plants, the seasons in which to gather them, and the preparation for sale, together with many other hints which will prevent the labour of children in collecting wild herbs for medicinal use proving useless, as it may do unless properly guided. Experience has shown that there is little or no call for many of the herbs recommended in the first edition of "Herb-Collecting," and in the new edition omissions have been made, while special attention is called to those plants for which there is a brisk demand. The booklets can be obtained from the National Herb-Growing Association, Queen Anne's Chambers, S.W. 1, or from the Gardening Association, Lower Sloane-street, S.W. 1, price 3*d*. each, or 2*s*. 9*d*. per dozen, post-free.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

The following journals, magazines, &c. have been received:—Journal of the Royal Sanitary Institute, Public Health, Shield, Canadian Journal of Medicine and Surgery, Proceedings of the Royal Society of Medicine, Bulletins et Mémoires de la Société Médical des Hôpitaux, British Dental Journal, Clinique Ophtalmologique, Journal of Hygiene, Archives Médicales Belges, Review Neurology and Psychiatry, Maternity and Child Welfare, Canadian Medical Association Journal.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, March 26th.

ODONTOLOGY (Hon. Secretaries—F. R. Smyth, F. N. Doubleday, J. Howard Mummery): at 6 P.M. (*Cases* 5 P.M.)

Exhibition and Report (followed by a Discussion):
On Clinical Cases of Gunshot Injuries of the Jaws.

Cases will be shown by Mr. G. Paton Pollitt, Mr. B. Maxwell Stephens and Mr. F. N. Doubleday from 5 to 6 P.M.

Tuesday, March 27th.

MEDICINE (Hon. Secretaries—Charles R. Box, W. Cecil Bosanquet): at 5.30 P.M.

Lantern Demonstration:
Dr. C. R. Box and Mr. Walter Edmunds: Autochromes illustrating the Rashes of Specific Fevers.

HUNTERIAN SOCIETY, at the Skin Department of St. Bartholomew's Hospital.

WEDNESDAY.—4 P.M., Dr. H. G. Adamson: Demonstration on Interesting Cases.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East.

TUESDAY AND THURSDAY.—5 P.M., Goulstonian Lectures:—Dr. C. H. Miller: Paratyphoid Infections. (Lectures II. and III.)

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

CHADWICK PUBLIC LECTURES.

THURSDAY (at the Royal Society of Medicine, 1, Wimpole-street, W.).—5.15 P.M., The Hygiene of the Soldier's Heart.

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY.—4 P.M., Lecture XI.:—Lieut.-Col. Sir A. Pearce Gould, K.C.V.O.: Personal Habits in Relation to Public Health in Time of War. Prof. G. Sims Woodhead, Dr. G. B. Hunter, and Miss L. Barker have promised to take part in the discussion.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON, W.C. 2.

MANAGER'S NOTICES.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d*. The rates of subscription remain as revised in October.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C. 2, are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

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TO COLONIAL AND FOREIGN SUBSCRIBERS.

Subscribers abroad are particularly requested to note the rates of subscriptions given on page 7.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the rates shown, whatever be the weight of any of the copies so supplied.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, March 21st, 1917.

Date.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Tem.	Wet Bulb.	Dry Bulb.	Remarks.
Mar. 15	...	63	45	35	35	36	Fine
,, 16	...	72	50	36	39	40	Cloudy
,, 17	...	90	58	39	40	42	Fine
,, 18	...	77	58	41	45	47	Cloudy
,, 19	...	71	51	41	42	44	Overcast
,, 20	0·05	77	46	38	37	40	Cloudy
,, 21	0·05	70	42	35	34	36	Cloudy

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

Communications, Letters, &c., have been received from—

A.—Capt. M. B. Arnold, R.A.M.C.; Lady Angela Adair, Dunadry; Mr. F. W. F. Arnaud, Maidstone; Admiralty, Medical Department, Director-General of; Messrs. R. Anderson and Co., Edinburgh; Aberdeen Medico-Chirurgical Society, Librarian of; Mr. J. E. Adams, Lond.

B.—Dr. O. C. Bradley, Edinburgh; Mr. P. J. Byrne, Clonmel; Messrs. Butterworth and Co., Lond.; Fleet-Surg. Bassett-Smith, C.B.; British Red Cross Society, Lond., County Sec. of; Messrs. F. P. Baker and Co., Lond.; British Medical Association, (Malta Branch, Valetta), Hon. Sec. of; Bishopstone House, Bedford, Lady Supt. of; Messrs. W. H. Bailey and Son, Lond.; Messrs. Bale, Sons, and Danielsson, Lond.; Dr. A. E. Boycott, Lond.; Messrs. D. Brown and Son, Huddersfield; Capt. N. Booth, R.A.M.C.; Bristol Royal Hospital for Sick Children, Sec. of; Blackpool Gazette News, Ltd; Dr. W. Bennett, Slaidburn; Brentford Guardians, Clerk to the.

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Letters, each with enclosure, are also acknowledged from—

A.—Lieut. G. Arthur, R.A.M.C.; Dr. J. H. Ashworth, Margate; Ashwood House, Kingswinford; Dr. T. G. Atkins, Cork; A. R. M.

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